

CLOSURE PLAN

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DOCK 2-B, BUILDING 45  
AND BUILDING 49  
AT THE FORMER TRW INC.  
TAPCO FACILITY

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SUBMITTED TO

**TRW**  
INCORPORATED

MODIFIED , SEPTEMBER, 1988

**ENGINEERING-SCIENCE**

DESIGN • RESEARCH • PLANNING

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CLOSURE PLAN  
DOCK 2-B, BUILDING 45  
and  
BUILDING 49  
at the  
FORMER TRW INC. TAPCO FACILITY

Submitted to  
TRW INCORPORATED  
Lyndhurst, Ohio

Modified  
SEPTEMBER 1988

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CLOSURE PLAN  
DOCK 2-B, BUILDING 45  
and  
BUILDING 49

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## 1. DESCRIPTION OF FACILITY

The TAPCO facility, formerly owned by TRW Incorporated, is located about two miles south of Lake Erie, in the City of Euclid, Cuyahoga County, Ohio. As shown in Figure 1.1, the property boundaries include more than 200 acres on both sides of Euclid Avenue. All of the buildings are located on the north side of Euclid Avenue.

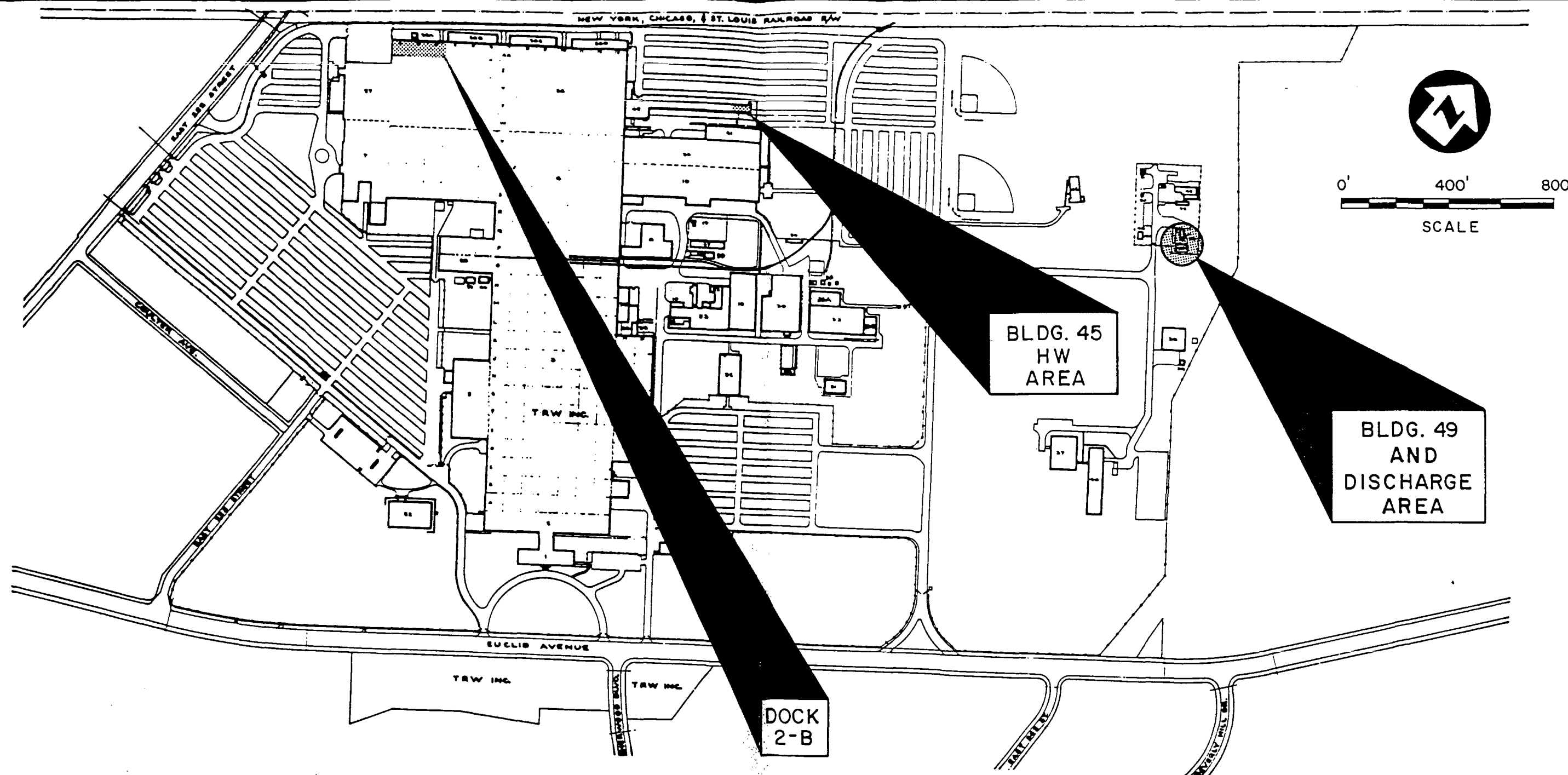
Construction of the TAPCO facility was started in the 1940s by the then Thompson Aircraft Products Company, later TRW Incorporated. Over a period of more than forty years, numerous and varied manufacturing operations took place on the site, including forging, heat treatment, machining, metal finishing and electroplating. Additional activities, including aircraft engine and weapons testing, took place under contract to the Federal government.

TRW submitted a RCRA Part A Permit Application for the TAPCO facility on 17 November 1980. An Interim Status Permit was granted 14 May 1982. (The EPA Facility Identification Number for TAPCO is OHD004179-453). An application for revision, which was filed on 4 June 1984, was withdrawn 21 December 1984. TRW requested that the TAPCO facility be removed from the treatment, storage and disposal facility category, because it was only a 90-day generator. Appendix 1 includes a copy of the interim status permit.

In 1986, the TAPCO property and the manufacturing and contract testing facilities there were sold by TRW Incorporated. ARGO-TECH Inc. purchased the property and a portion of the manufacturing and testing facilities, effective 20 October 1986. Airfoil Forging Corporation (now, Airfoil Forging Textron) purchased other manufacturing facilities effective 29 August 1986.

Pursuant to the purchase agreements, TRW Incorporated will proceed with closure of those portions of the TAPCO facility which had been granted interim status. ARGO-TECH and Aircraft Forging Textron are generators of most of the same hazardous waste materials formerly generated by TRW, but they do not plan to store any hazardous waste materials on-site for periods longer than 90 days.

The sections that follow present the Closure Plan for the three hazardous waste management units on the TAPCO site which are to be closed. The units are Dock 2-B, Building 45 and Building 49. This Closure Plan represents a complete closure of all RCRA regulated units at the Tapco facility operated by TRW under interim status.



TAPCO SITE  
LOCATION OF AREAS TO BE CLOSED

## 2. DESCRIPTION OF WASTE MANAGEMENT UNITS TO BE CLOSED

This Closure Plan represents a complete closure of all RCRA regulated units at the TAPCO facility operated by TRW under interim status.

Figure 1.1 shows the TAPCO site and the locations of the units to be closed. Dock 2-B, Building 45 and Building 49 are all in the northern portion of the property. Dock 2-B and Building 45 were used for storage up to 90 days of drummed hazardous wastes generated on-site. The Building 49 area includes a fenced compound used for torpedo testing. Torpedo fuel and liquid residues remaining after test firing were stored in drums and a 1000 gallon underground tank at Building 49. Accidental discharges of fuel residue and cyanides generated by test firing occurred onto a formerly swampy area to the south of the fenced compound.

The descriptions that follow are based in part on information included in the interim status RCRA permit and the application for revision (Appendix 1). Additional information from a sampling and laboratory analysis program at the units to be closed, which was undertaken in conjunction with preparation of this Closure Plan, is presented in Section 5.

### 2.1 Dock 2-B

Dock 2-B is the site of a hazardous waste storage area for 55 gallon drums. This 8100 sq.ft. area is located near the northwest corner of the TAPCO facility, adjoining Building 26. It consists of a concrete base covered by wood block flooring. When originally built, about 1950, this was a general purpose shipping and receiving dock serving the site.

Since about 1981, Dock 2-B has been used mainly for storage and subsequent shipment of hazardous wastes in drums. As shown in Figure 2.1, an area of about 1200 sq.ft. at the southeast corner of the Dock has been used for secured storage of hazardous wastes from all hazardous waste generating activities at the TAPCO facility. This area is enclosed by a metal cage about 9 ft high, with a locked sliding gate. In TRW's application for the interim status permit, Dock 2-B was marked as a "Drum Storage Area" in the sketch provided on Page 5. Its process design capacity was listed as

23,100 gallons (i.e., 420 drums) on Page 1 (See Appendix 1). The maximum inventories stored of each waste are listed in Table 2.1.

Effective 20 October 1986, ARGO-TECH, Inc. assumed responsibility for operation of this area. TRW Inc., pursuant to its purchase agreements with ARGO-TECH, plans to close the original Dock 2-B caged area and to provide a new storage area with facilities for spill containment and control. ARGO-TECH will continue to use Dock 2-B for storage of hazardous waste generated on-site for periods not exceeding 90 days.

A second caged area was added to the west of the original area. This new area is operated by Airfoil Forging Textron (AFT), specifically for hazardous waste generated by AFT manufacturing operations.

## 2.2 Building 45

Building 45 is located in the north-central portion of the TAPCO site. As shown in Figure 2.2, this long, narrow building adjoins Building 26 and extends about 450 ft northeastward into a fenced compound. It was constructed of concrete during the 1940s, specifically for rifle test firing ranges. A wall along the entire length of the building separates Range A, on the north side, from Range B.

The Target House near the eastern end is separated from the main building by a firing tunnel. It is provided with security doors, originally to prevent accidental entry during firing tests. A pit located to the east of the Target House, originally for recovery of spent bullets, and a target trench to the west, isolate the Target House floor.

The former Target House was put into use for storage of drummed hazardous waste prior to 1980 and continued through 1985. It was selected for this, partially on the basis of distance from plant operations and limited access. The Range A side provided about 315 sq.ft., and the Range B side provided an additional 420 sq.ft. In TRW's application for the interim status permit, the Building 45 Target House was marked as a "Drum Storage Area" in the sketch provided on Page 5. Its process design capacity was listed as 4,400 gallons (i.e., 80 drums) on Page 1 (See Appendix 1). The maximum inventories stored of each waste are listed in Table 2.1.

As noted in Figure 2.2, the concrete floor was built sloping downward to the east. Metal dike plates were installed along the eastern edge of

the floor and grouted, to prevent any spillage from leaking into the former water pit. The square concrete extensions of the Target House floor along the north and south walls each have a 55 gallon sump to collect spillage.

The Building 45 Target House Hazardous Waste Storage Area was removed from service, and the last 55 gallon drum containers of hazardous waste that had been stored there were removed prior to the sale of the property by TRW Incorporated. ARGO-TECH Inc., has no plans for further use of Building 45 as a hazardous waste storage area at present.

### 2.3 Building 49

Building 49 is located in the northeastern portion of the TAPCO facility, inside a fenced compound which isolated torpedo testing activities. Building 49 was built in 1965, originally containing one cell for test firings; a second cell was added later. The storage area for virgin fuel was located on the eastern side of the building. The other buildings within the compound include a locker room and laundry for torpedo test personnel (Building 48) and storage buildings (Buildings 42, 43, 50 and 51). See Figure 1.1.

Wastewater containing liquid fuel residue and cyanides is generated by the torpedo test firing. Until late 1985, the wastewater was discharged through a 1000 gallon underground steel separation tank. Liquid residues of unburned fuel were separated in the tank and stored there until hauled off-site for disposal by incineration within 90 days. See Figure 2.3 for details on the tank construction and installation.

In TRW's application for the interim status permit, the Building 49 Area was marked as a "Waste Fuel Storage Area" in the sketch provided on Page 5. The process design capacity for the storage tank there (S02) was listed as 1000 gallons on Page 1 (See Appendix 1). The maximum inventory of waste stored was 500 gallons, as listed in Table 2.1.

Unintentional discharges from the separator tank containing cyanides and liquid residues of unburned torpedo fuel were discovered in 1985 in a swampy area on the south side of the fence. The National Response Center was notified, and TRW authorized studies of the discharge area, to define the extent of the soil affected. The study report is enclosed as Attachment 2. The principal findings are summarized in Section 5.3. The volume

of contaminated soil and sediments to be removed is estimated to be 114.4 cu.yd. (See Sections 6.4 and 6.5 and Attachment 2).

Since the discovery of the discharge, overflows from the separator tank has been diverted to, and stored in three holding tanks on the west side of Building 49 until hauled for off-site disposal (See Figure 2.3). A new torpedo test facility has been built elsewhere on the TAPCO Site (Building 33), and all torpedo testing activities will be shifted to that location.

#### 2.4 Topography and Soils

The hazardous waste management units to be closed lie in the lake plain, which resulted from deposition of clay, silt and fine sands during a stage of glacial lake inundation. The area is characterized as nearly level to gently sloping. The undisturbed vegetative cover would be thick grass, brush and trees. Drainage is poor, due in part to the flat topography and to the low permeability of the predominant silty soils.

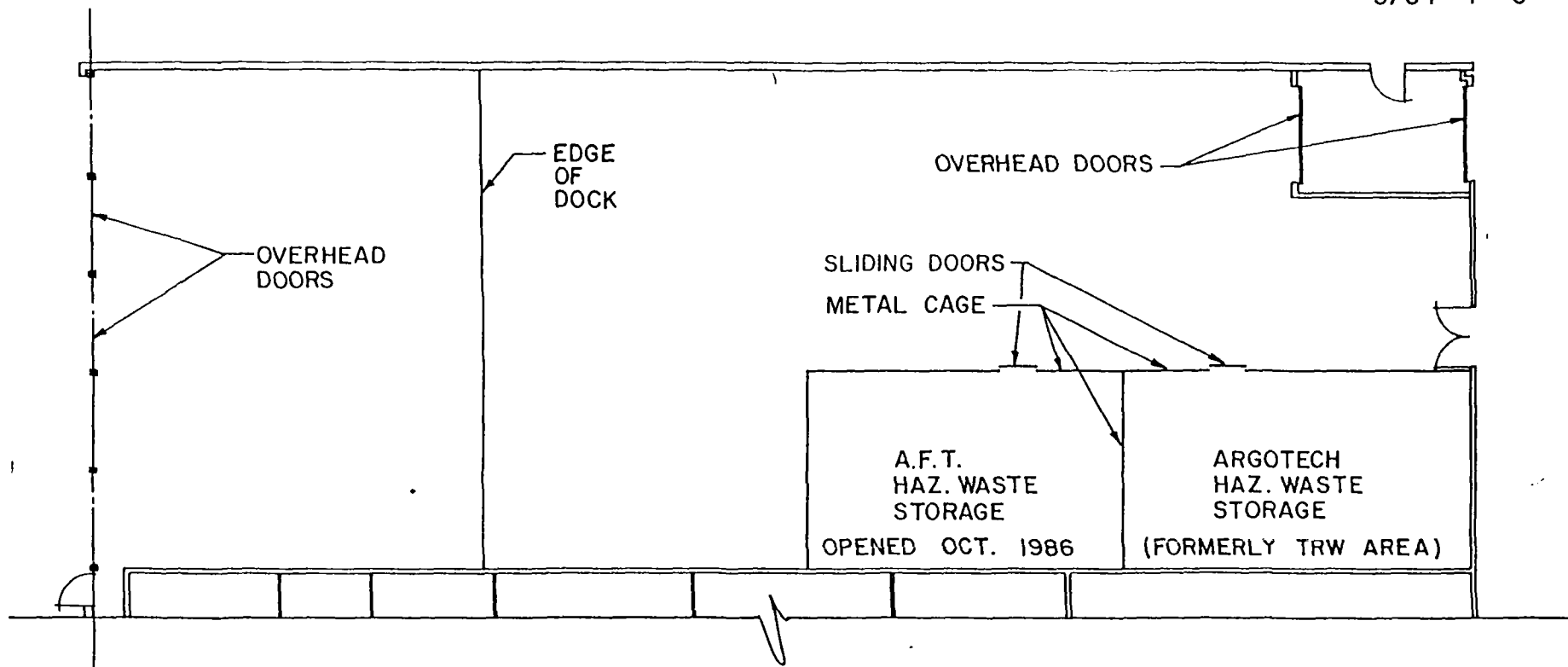
The surface soils in the lake plain are generally derived from very fine silt and clay sediments deposited from past higher lake stages, except where beach sand remnants remain. These lacustrine (lake) surface deposits are typically about 10 feet in thickness. These surface soils are generally considered to be very poor sources of ground water supply. Most of the soil at the former TAPCO site is classified as urban land, since a large proportion of the surface is covered by buildings and asphalt or concrete pavement.

Underlying the surface soils is a variable thickness of tight glacial till composed of hard clayey to sandy silt with angular gravel and rock fragments. The consolidated deposits underlying the former TAPCO site consist of a series of shale formations of low permeability, together more than 800 ft thick. These shales are of Mississippian and Devonian age. The formations are not considered to be productive for ground water supply.

Appendix 2 provides a more detailed description of the regional and site topography. Details on the surface drainage and the surface and subsurface soils at the former Building 49 discharge area also are found in Attachments 2 (the Building 49 Study Report, Sections 3 and 4).



APPROXIMATE SCALE  
3/64" = 1' - 0"



DOCK 2-B HAZARDOUS WASTE  
STORAGE AREA

BUILDING 26 BAYS AA-1, AA-2 AND AA-3

2-5

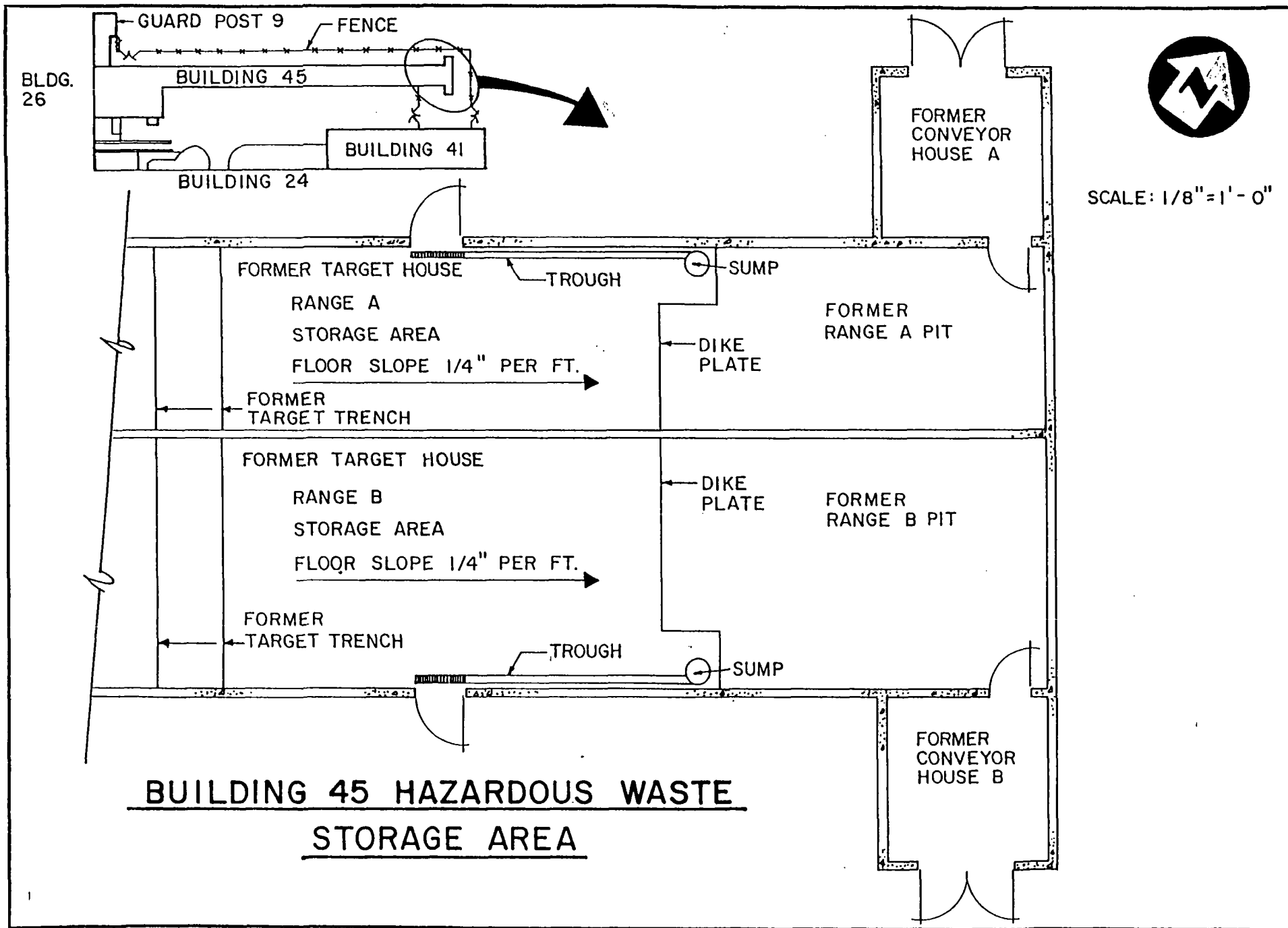


FIGURE 2.2

TABLE 2.1

## MAXIMUM INVENTORIES OF WASTES STORED AT RCRA FACILITIES

Basis: Operational Records and Manifest Files

Dock 2-B (former TRW caged area)

F001	Freon Degreasing Residue	6 drums ( 300 gallons)
F001	Spent Trichloroethylene	22 drums (1,100 gallons)
F001	Spent Tetrachloroethylene	8 drums ( 400 gallons)
F002	Trichloroethane Recovery Still	
	Bottoms	11 drums ( 550 gallons)
F005	Spent Methyl Ethyl Ketone (MEK)	2 drums ( 100 gallons)
F005	Spent Dioxane/MEK mixed solvent	1 drum ( 50 gallons)
D008	Waste Ceramic Slip	57 drums (28,000 lbs)
D002	Corrosive Solid	78 drums (39,000 lbs)

Building 45

F003	Spent Xylene	1 drum ( 50 gallons)
F008 D007	Sludges from Chromium Electroplating Bath	4 drums (2,000 lbs)

Building 49

D003	Torpedo Fuel Residue	( 500 gallons)
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### 3. MAPS OF FACILITY

FIGURE 1.1 - Tapco Site: Areas To Be Closed

FIGURE 3.1 - Topographic Map of the Tapco Facility (Aerial Photo Base)  
Scale 1" = 200'

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#### 4. DETAILED DRAWINGS OF THE UNITS TO BE CLOSED

FIGURE 2.1 - Dock 2-B Hazardous Waste Storage Area

FIGURE 2.2 - Building 45 Hazardous Waste Storage Area

FIGURE 2.3 - Building 49 Plans and 1,000 Gallon Separator Tank - Details  
(TAPCO Drawing M-1177)

## 5. LIST OF HAZARDOUS WASTES HANDLED

According to the RCRA Interim Status Permit and the Application for Revision, the wastes stored in Building 45 and Dock 2-B included (F002) trichloroethane recovery still bottoms and (F006) wastewater treatment sludges from electroplating operations, containing cyanides and metal hydroxides. The torpedo fuel residues at Building 49 were listed as reactive (in their virgin state) (See Appendix 1). See Table 2.1 for the maximum inventories stored.

In the course of preparing this Closure Plan, sampling and chemical analysis were undertaken, to define further the characteristics of hazardous wastes and residues which may be involved in the Closure. A copy of the laboratory reports is provided as Attachment 1. The results are discussed in the paragraphs that follow.

### 5.1 Dock 2-B

The uncaged area flooring was sampled on 28 May 1987, by removal of wood blocks at the centers of eight randomly selected areas defined by the 10 ft spacing grid shown in Figure 5.1 and scraping the wood surfaces with a chisel. A composite sample of the scrapings was submitted for laboratory analysis to determine priority pollutants and RCRA Hazard Characteristics. The wood blocks in the caged former TRW storage area can be expected to have similar characteristics. Since hazardous waste was stored in this area and spilled materials may have been absorbed, these blocks will be removed. (However, the wood blocks outside this area are still serving their original purpose and will not be removed, unless they are found to have become contaminated due to spilled hazardous waste. Sampling and analysis during the closure will determine that, as discussed in Section 6.11).

The results, as summarized in Table 5.1, show characteristics which would require that any flooring removed from the former TRW Hazardous Waste Storage Area during closure must be disposed of as a hazardous waste. A spectrum of priority pollutant organics was detected. These organics, which include both volatile organics and polynuclear aromatics (base/

neutral extractable semi-volatiles), are believed to be preservative chemicals which were applied to the wood blocks by the manufacturer.

However, those were the only characteristics which would be considered to be hazardous. The TCLP (Toxicity Characteristic Leaching Procedure) extraction did not yield detectable concentrations of any regulated PCBs, pesticides or herbicides. None of the regulated heavy metals was present at a concentration which would render the flooring material EP Toxic. Cyanide was detected at a low concentration, but corrosivity and sulfide reactivity tests were both negative. The cyanide is believed to be a preservative chemical residue, since operations records for Dock 2B indicate that no hazardous wastes containing cyanides have ever been stored there.

#### 5.2 Building 45

The Target House flooring was sampled on 29 May 1987, by scraping the concrete flooring surfaces with a chisel at the centers of eight randomly selected areas defined by the 5 ft spacing grid shown in Figure 5.2. A composited sample of the scrapings was submitted for laboratory analysis to determine priority pollutants and RCRA Hazard Characteristics.

The results, as summarized in Table 5.1, show characteristics which would require that any concrete flooring removed from the Target House during closure must be disposed of as a hazardous waste. The scrapings are EP Toxic, due to the presence of high TCLP extraction chromium concentrations.

However, the other characteristics would not be considered hazardous. The tests of corrosivity, ignitability and sulfide reactivity were negative. No priority pollutant organics, PCBs or TCLP extraction herbicides and pesticides were present at detectable concentrations.

#### 5.3 Building 49

In 1985, an unintentional discharge into the swampy area to the south of Building 49 was found. The National Response Center was notified, and TRW authorized studies of the discharge area, to define the extent of the soil affected. The study report is enclosed as Attachment 2. The principal findings in that study are as follows (See Figure 5.3):

- o An irregularly shaped 300 sq.ft. area around the former discharge pipe was found to contain detectable concentrations of Propylene

Glycol Dinitrate (PGDN), the principal component of the torpedo fuel. The average PGDN concentration for the top 1 ft of soil in this area was 1900 mg/kg. Overlapping this was a larger area, about 600 sq.ft. of soil containing detectable cyanides, with an average concentration of 10 mg/kg for the top 1 ft of soil. (The detection limits were, respectively, 25 mg/kg for PGDN and 0.25 mg/kg for total cyanides.)

- o Migration of the chemical residues away from the soils near the former discharge pipe was attributed principally to erosion of soil particles at times of high stormwater flow. Two isolated samples of sediments from the 120 ft long runoff stream were found to contain 240 and 80 mg/kg of PGDN in the top 1 ft. Sediment cyanide concentrations along the runoff stream averaged 6 mg/kg in the top 1 ft. There also has been migration of cyanides by solubilization and transport into the runoff stream; observed cyanide concentrations in the runoff stream water ranged from 0.3 to 1.2 mg/L (PGDN, which is not miscible with water, would not migrate by that mechanism).
- o A narrow belt of soil containing cyanide at concentrations 0.5 to 2 mg/kg in the top 1 ft was found encircling Building 49, at distance of 100 to 300 ft from former discharge area. The cyanides in this belt are believed not to have originated from the discharges, but from downwash of exhaust gases vented during torpedo tests (See Figure 5.4).

Additional soil sampling and laboratory analysis for cyanides was undertaken in conjunction with the preparation of this Closure Plan, to further define the extent of soils containing cyanides and to determine characteristics of the soil in the vicinity of Building 49, for purposes of treatment and disposal. The results are summarized in Table 5.2 (See Attachment 2, the Building 49 Study Report, for details).

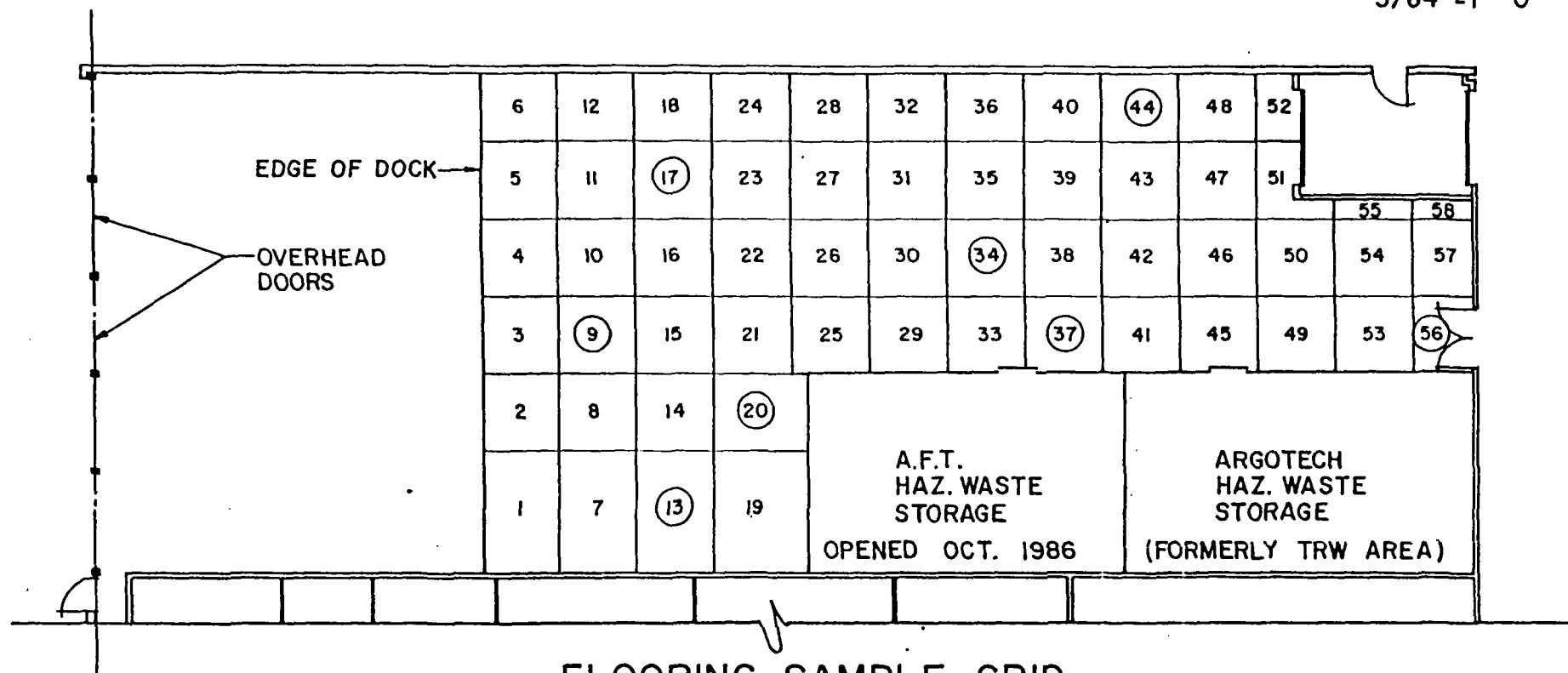
The soil at the former discharge pipe is considered hazardous because of the presence of PGDN and cyanides. However, the RCRA characteristics tests for ignitability, corrosivity, sulfide reactivity and EP Toxicity

were negative. Priority pollutant organics and PCBs were not present at detectable concentrations.

Additional characteristics were determined for the recommended treatment of soil excavated from the former discharge area by incineration (to be followed by ultimate disposal of the resultant ash by landfilling). The observed high flash point, low net heating value, high ash content and high solids content in discharge area samples were essentially the same as those of the background area samples.



APPROXIMATE SCALE  
3/64"=1'-0"



FLOORING SAMPLE GRID  
DOCK 2-B HAZARDOUS WASTE  
STORAGE AREA

BUILDING 26 BAYS AA-1, AA-2 AND AA-3

FIGURE 5.1

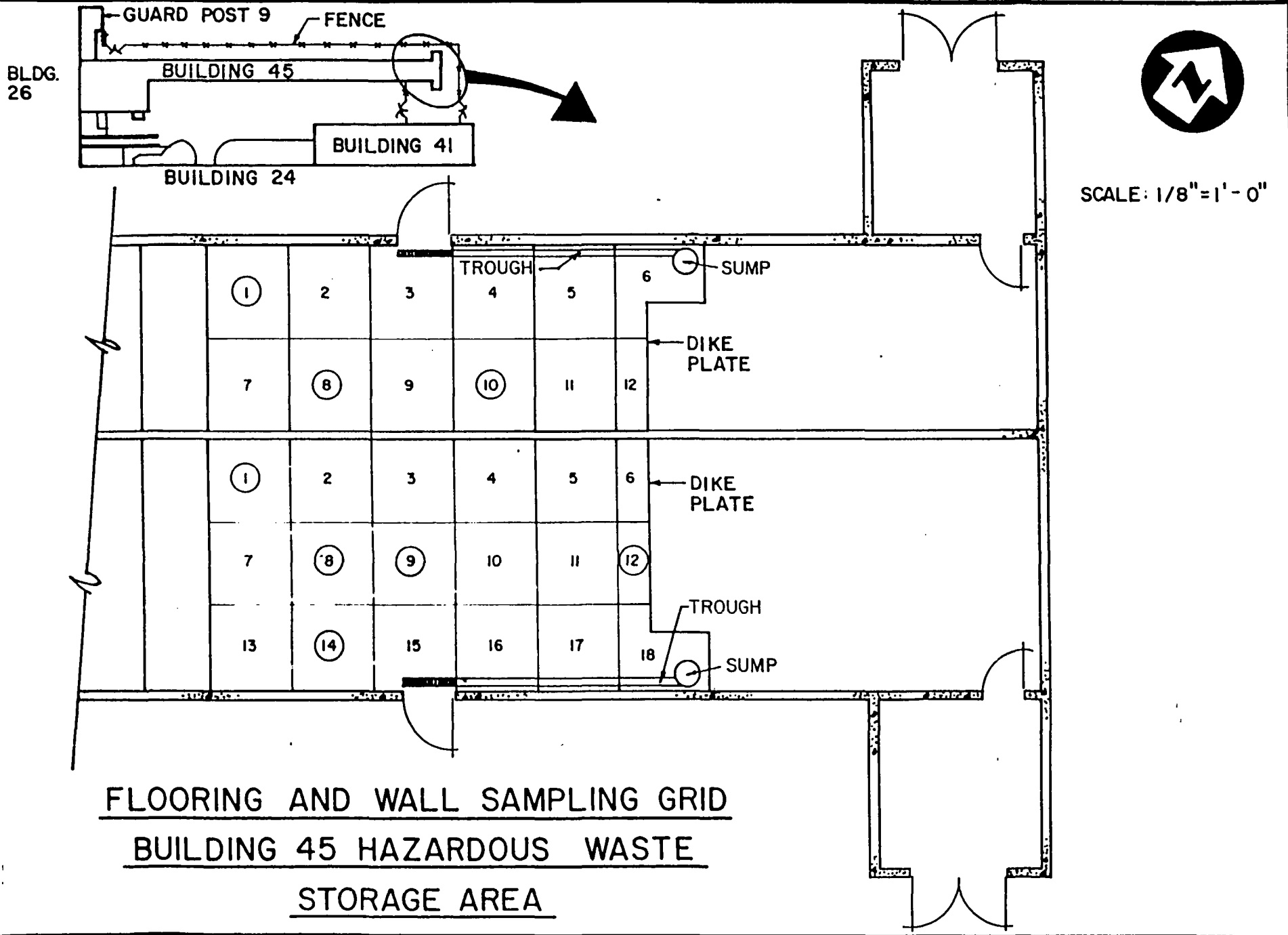


FIGURE 5.3

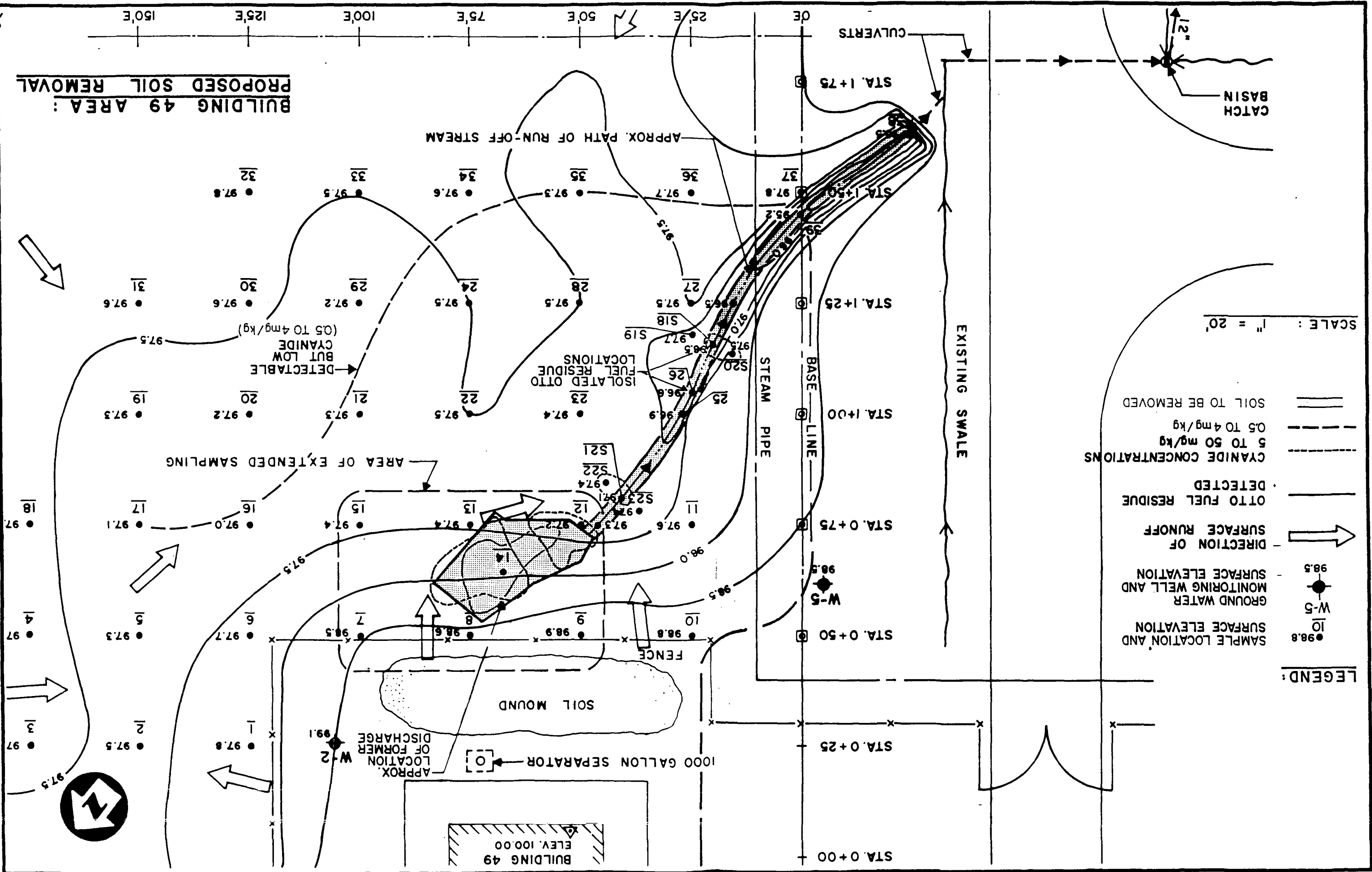


TABLE 5.2

ANALYTICAL CHARACTERIZATION OF SOIL SAMPLES NEAR BUILDING 49  
Laboratory-Composited Samples (except as noted below)

Parameters	Method	Units	Concentrations		
			Back-ground Area	Dis-charge Area	Regulatory Limit
Volatile Organic Compounds	8240				
Priority Pollutants		mg/kg	ND	ND	--
Semi-Volatile Organics	8270				
Polynuclear Aromatics		mg/kg	ND	NA	--
Other Regulated Semi-Volatiles		mg/kg	ND	NA	--
Pesticides/Herbicides	TCLP	mg/kg	ND	ND	--
PCBs	8080	mg/kg	ND	ND	--
Total Cyanides*	9010	mg/kg	0.7	17	BDT
PGDN (Torpedo Fuel)*	Gas Chrom.+	mg/kg	NA	543	--
Leachate Heavy Metals	TCLP				
Silver		mg/L	BDT	BDT	5.0
Arsenic		mg/L	BDT	BDT	5.0
Barium		mg/L	1.5	1.2	100
Cadmium		mg/L	BDT	BDT	1.0
Chromium		mg/L	0.04	0.05	5.0
Lead		mg/L	0.54	0.16	5.0
Mercury		mg/L	BDT	BDT	0.2
Nickel		mg/L	0.49	BDT	--
RCRA Characteristics					
Ignitability	Flash Pt.	°F	>180	>180	>140
Corrosivity	pH	S.U.	NA	NA	2-12
Reactivity (sulfide)	Sulfide	mg/kg	60	50	BDT
Incineration Characteristics					
% Solids			70%	73%	>30%
% Ash			NA	72%	--
Heating Value		BTU/lb	NA	<1000	--

## NOTE:

BDT = Below Detection Limit

NA = Analysis Not Required

ND = All compounds in this category BDT

\* = Averages for 3-4 Samples

-- = No Limit at Present

+ = See Appendix 3 for details

## 6. SCHEDULE FOR CLOSURE

Closure of the Hazardous Waste Management Facilities at the TAPCO site will consist of the following:

In the Building 49 Area (the Torpedo Test Compound):

- o Site work, as necessary for equipment access,
- o Excavation of contaminated soil from the Spill Area and dredging of the runoff stream, and removal for off-site incineration,
- o Soil sampling to ensure that the soil that remains does not contain detectable PGDN and/or cyanides at concentrations exceeding 10 mg/kg,
- o Removal and decontamination of the 1,000 gallon underground Separator Tank and auxiliary piping, and
- o Backfilling and final grading of the area of soil excavation.

At the former TRW Hazardous Waste Storage Area at Dock 2-B:

- o Removal and off-site incineration of wood flooring blocks, and
- o Cleaning of the underlying concrete and analysis of rinseates to verify that hazardous waste residues have been removed.

At the Building 45 Target House:

- o Cleaning of the concrete flooring and analysis of rinseates to verify that hazardous waste residues have been removed.

If necessary, demolition of concrete flooring at Building 45 and/or Dock 2-B; off-site disposal of the rubble; and soil sampling to verify that no hazardous waste residues remain.

Figure 6.1 shows the schedule in bar-chart form, based on days elapsed after approval of the Closure Plan by the Director of Ohio EPA. The Closure Plan activities can be completed within the required 180 days. In the event that approval occurs in the autumn, it may be necessary to extend closure activities beyond 180 calendar days, due to the onset of winter conditions hampering outside work at Building 49 and access to the other areas undergoing closure.

Figures 6.2, 6.3 and 6.4, respectively, show the layout of closure facilities and activities at Dock 2-B, Building 45 and Building 49. The paragraphs that follow briefly describe the Closure activities. Additional details on closure activities and contingency planning are provided on Air Emissions Control during closure (Section 7); Personnel Safety and Fire Protection (Section 8); Decontamination Efforts for tanks and piping to be removed during closure (Section 9); Criteria for Soil Contamination (Section 10); Sampling Plan for Soil (Section 11); Description of Removal Efforts (Section 12); and Description of Closure Equipment Cleaning (Section 14).

The activities comprising closure are as follows:

- 6.1 Notification of Approval of the Closure Plan by the Ohio EPA received by TRW. The schedule allows for delays in delivery of this notice up to a full work week (7 days).
- 6.2 The Hazardous Waste Management Units at Dock 2-B and Building 49 are vacated by ARGO-TECH. The new facilities for Torpedo Testing at Building 33 are partially in use as of 1 August 1987. It is assumed that construction there will have been completed on or before the notification date above, so that ARGO-TECH will have ceased Torpedo Testing activities and removed all stored torpedo fuel at Building 49 within five weeks (35 calendar days) thereafter. It is also assumed that all hazardous waste stored by ARGO-TECH at Dock 2-B can be removed within the same time limit for off-site treatment and disposal, or transferred to a new area to be provided by TRW.
- 6.3 Selection of Contractors by TRW and mobilization of equipment is scheduled to take place in the five work weeks (35 calendar days) following Receipt of Approval of the Closure Plan.
- 6.4 Site Work at Building 49 for equipment access is required before any other closure activities can begin there (See Figure 6.4). The fence on the southeast side of the Torpedo Test complex must be removed. Decontamination facilities will be set up during this time. A gravel or slag roadway, 12 ft wide x about 150 linear ft., will be installed

about 10 ft south of the soil to be excavated, for access by the heavy equipment which otherwise may be mired in the soil after rains. This activity can start as soon as possible, weather permitting. Once started, it will take about two work weeks (14 calendar days) to complete, allowing for possible delays due to adverse weather.

6.5 Excavation of Contaminated Soil from the Building 49 Spill Area will require a Gradall or Clamshell. Soil will be excavated from the approximately 625 sq.ft. polygon area shown in Figure 2.5, to a depth of 1 ft below the interface of competent clay. Sections through the polygon area are shown in Figures 6.5 and 6.6. Assuming that the excavation averages about 4 ft depth, it will amount to about 95 cu.yd. This activity can begin immediately after completion of the roadway, and will take about one work week, weather permitting. As soon as the excavation has been completed, soil sampling can begin (See Subsection 6.9).

6.6 Dredging of the Runoff Stream will also require the Gradall or Clamshell unit. Sediments will be removed from the approximately 120 ft length of the stream, to a depth of 2 ft. A profile section along the stream is shown in Figure 6.7. Assuming a bucket width of 2 ft, the sediments removed would amount to about 18 cu.yd. An additional 1.4 cu.yd. of sediments will be removed from the first culvert (at the south end of the runoff stream) by hand shoveling. The dredging can begin after completion of the excavation of contaminated soil, and will take about one work week, weather permitting. Soil sampling can begin along the runoff stream bed as soon as the sediment dredging activity has been completed (See Subsection 6.9).

6.7 Off-Site Disposal of the Soil and Sediments. The two preceding activities will generate about 130 cu.yd. of soil and sediments, assuming about 10% expansion. This material will be transferred to containers, covered with plastic sheets to keep out rainwater and hauled off-site for disposal by incineration. (In the event that an alternative treatment technology becomes available before approval of the Closure Plan, TRW will investigate its feasibility.) A 25 ft.x 25

ft. container staging area to the north of Building 49 will be protected from contamination by a 20 mil plastic sheet. This activity will follow the soil and sediment removal, as quickly as practicable. Upon completion of this activity, the plastic sheet will be inspected for damage, to determine whether soil sampling would be required.

- 6.8 Removal and Decontamination of the 1,000 Gallon Underground Separator Tank, the Three Overflow Holding Tanks and Auxiliary Piping can occur at any time following the excavation of contaminated soil. The auxiliary piping will be removed first, about 40 ft. of 6" VT pipe from the former discharge area to the separator tank outlet, about 10 ft. of 6" VT from the separator tank inlet to the connection with the torpedo test cell drains, and about 60 ft. of 6" VT pipe from the separator tank outlet to the overflow holding tanks. Any free liquid in the tanks will be pumped out and retained for off-site disposal, if necessary, pending analysis for PGDN and total cyanides. The tanks will then be exhumed.

This activity will require a backhoe to unearth the underground facilities, which lie at typical depths up to about 4 ft. It can be completed within two work weeks, weather permitting. Decontamination of the tanks and piping are described in Section 9.

- 6.9 Soil Sampling at Building 49 and Subsequent Laboratory Analysis of the Soil Samples will begin upon completion of the excavation, removal or demolition activities above. A maximum of five weeks (35 calendar days) will be required for the laboratory results to be reported. A grid sampling strategy will be followed in the Polygon area to ensure that no contaminated soil remains. The proposed sampling grid and other details of the soil sampling are discussed in Section 11.

Soil samples will be taken at four locations formerly under the separator tank, four locations under the overflow holding tanks and at 5 ft. intervals along the former piping. Samples also will be taken at all pipe connections and any other locations appearing to have suffered leakage.

A Soil Boring rig will be used to take the soil samples at Building 49. The soil samples will be collected in Shelby Tubes representing 1 ft intervals of depth below the surface (after excavation) down to the bedrock shale.

The Shelby Tubes or cores will be capped, marked with identifying numbers and delivered to a certified laboratory for chemical analysis. Chain-of-Custody documentation and other quality control procedures are discussed in Section 11. The analysis will be only for PGDN and Total Cyanide.

Contingent on the soil sampling results, additional soil removal and/or dredging may be required to ensure that all hazardous waste and contaminated soil have had proper disposal. Soils found to contain higher than 10 mg/kg total cyanides or detectable PGDN will be removed for off-site disposal, pending laboratory analysis results for the soil samples. See Section 11.1 and the Risk Assessment (Attachment 2, the Building 49 Study Report, Appendix C) for details on Soil Sampling and acceptable cyanide levels.

Any equipment used in this task will have to be decontaminated before it can be allowed to leave the site (See Section 6.15).

6.10 Backfilling and Final Grading of the Soil Removal Area will use clean borrow material. Soil from the former shrapnel barrier mound to the south of Building 49 will be used for this. It does not contain detectable concentrations of cyanides, based on analysis of a composite sample which was collected during the preparation of this Closure Plan. This activity can begin after analytical laboratory tests confirm that the remaining soil is free of PGDN (torpedo fuel) and has acceptable cyanide concentrations (not exceeding 10 mg/kg). It can be completed within one work week, weather permitting.

6.11 Removal of Wood Flooring Blocks must precede the other closure activities at the Dock 2-B former TRW Hazardous Waste Storage Area. Wood blocks along the periphery of this area will be sampled, as indicated on Figure 6.2 and analyzed by GC/MS (Method 8240) for the spent solvents that were stored at the Dock, including TCE (trichloroethylene), PCE (tetrachloroethylene), TCA (trichloroethene), MEK (Methyl ethyl ketone), and dioxane (See Table 2.1), to identify wood blocks that may have been contaminated by spills. (Note that operational records indicate no spills.) Any peripheral blocks found to be contaminated will be removed, and additional samples further away from the former TRW area will be required to define the affected area.

6.12 Decontamination of Concrete Flooring at Dock 2-B and Building 45. The underlying concrete flooring at Dock 2-B will be decontaminated using three pressurized water rinses and scrubbing or scraping at areas showing visible residues. The rinseates will be analyzed for the solvents once stored at the dock (including TCE, PCE, TCA, MEK and dioxane) from spill residues that may have penetrated through the blocks. If any of the solvents is present at 1 mg/L or higher concentrations in the third rinseate, samples will be taken of the concrete at the selected areas defined on the 5 ft. grid spacing shown in Figure 6.8 in order to identify the contaminated areas.

The concrete flooring in the Building 45 Target House will be decontaminated using three pressurized water rinses and scrubbing or scraping at areas showing visible residues. The rinseates will be analyzed for xylene (GC, Method 8020) once stored there, total chromium (once stored there and detected in preliminary tests, Section 5.2) and total lead (residue from pre-RCRA use). If the third rinse contains 1 mg/L or higher of xylene or any of the suspected metals at a concentration exceeding those in the cleaning water, the concrete will be sampled in order to identify the specific areas contaminated. The samples will be taken by scraping the concrete at the selected areas defined by the 5 ft. grid spacing shown in Figure 6.9, which will extend the sampling to include the sumps and the pits adjoining the Target House on the east and west.

The rinseates will be retained for off-site disposal, pending the laboratory analysis results. Disposal as a RCRA waste will be required for rinseates containing 1 mg/L or higher of a regulated organic, or a metal at higher than EP toxic concentrations.

This activity can start after the wood flooring blocks have been removed. An estimated four weeks (28 calendar days) will be required for the laboratory results to be available.

6.13 Contingent Demolition of Concrete Flooring in the Dock 2-B former TRW Hazardous Waste Storage Area and in the Building 45 Target House is a contingent activity, to be carried out at either or both of the locations, only at the specific areas of the concrete flooring identified as containing hazardous waste residues. Level B personnel protection (impervious clothing and supplied air respiration) will be required in Building 45; Level C (air filtration) will suffice at Dock 2-B. A crew of two will work in each area, one operating the hammer and the other assisting with dust control. This activity will take about two weeks (14 calendar days) for a single crew. The dust control water spray will be collected for off-site disposal.

The soil underlying the concrete removed by demolition will be inspected visually for evidence of hazardous waste penetration through the now removed concrete flooring. If necessary, sampling and analysis and subsequent soil removal will be carried out.

All concrete flooring removed by demolition from both Dock 2-B and Building 49 will be replaced by patching. At Dock 2-B, additional concrete will be applied on top of the existing flooring (patched as necessary). This surface will be sealed by coating with coal-tar epoxy, to provide a suitable flooring service for future Argo-Tech use of the area for 90 day storage of hazardous materials.

6.14 Off-Site Disposal of Rubble from Dock 2-B and Building 45 will generate an estimated 5 tons of wood blocks, assuming a wood block thickness of 1.5 inches. The concrete demolished in the two buildings is estimated to amount to 20 cu.yd., assuming a concrete thickness of 1 ft and 75% expansion. The rubble will be accumulated at each location in separate covered containers. These activities will follow the demolition as quickly as practicable.

The wood blocks from Dock 2-B will be collected in fibre drums for off-site treatment by incineration, and the resultant ash will then be disposed of by landfilling. The concrete rubble resulting from demolition, if any, would have to be disposed of at a landfill certified for hazardous wastes.

6.15 Decontamination of Equipment Used in the Closure is scheduled upon completion of the activities above. A portable steam generator or a high pressure water sprayer will be set up near the work areas. Enclosures will be set up to collect the condensate or washwater, for off-site disposal (See Section 14). This will ensure that all particles of hazardous waste and/or contaminated soil adhering to the equipment are dislodged and disposed of. Decontamination of the equipment should be done as quickly as possible after the last use of each item.

6.16 Certification is the final task. The independent registered Professional Engineer retained by TRW will have been present on-site during all of the activities enumerated above. Upon completion of all required site work and after review of the soil sampling laboratory data, the Engineer shall submit his report which will certify that all closure activities have been carried out in compliance with the Closure Plan. Further details on Certification are in Section 15.

This activity should have been completed within two weeks (14 days) after completion of the Final Closure field activity.

# PROJECT SCHEDULE

TRW, Incorporated

TAPCO SITE CLOSURE

CL065.01

Project Mgr: A. L. Resetar

run time > 14:34:53 11-03-1987

page 1

CALENDAR DAYS ELAPSED

30

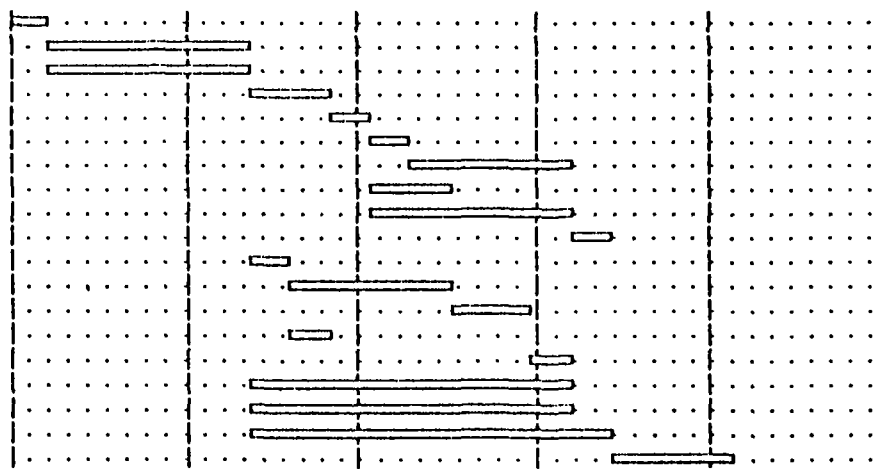
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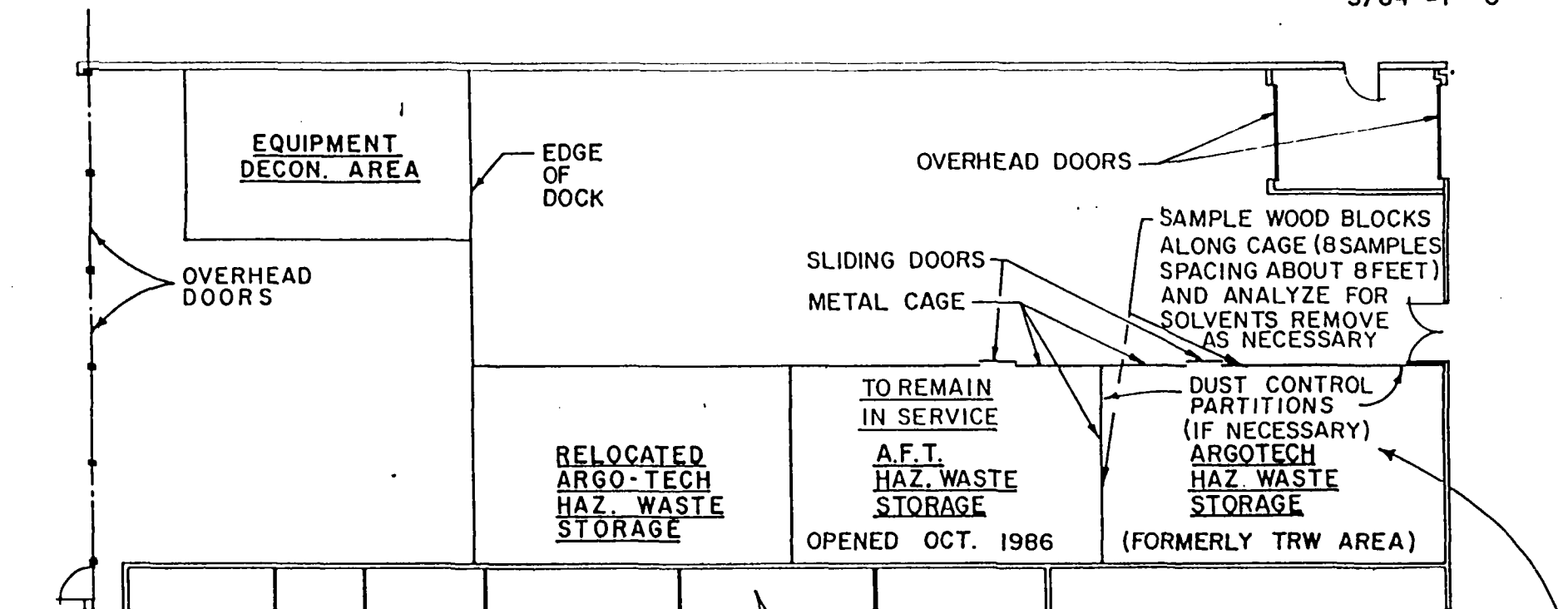
150

1. Notification of Approval
2. Dock 2-B & Bldg. 49 Vacated
3. Selection of Contractors & Mobil.
4. Site Work at Bldg. 49
5. Removal of Contam. Soil
6. Dredging the Runoff Stream
7. Off-site Disposal of Soil & Sed.
8. Removal of U.S.T. & Piping
9. Soil Sampling at Bldg. 49
10. Backfill & Final Grade at Bldg. 49
11. Remove Oak Flooring at Dock 2-B
12. Conc. Sampling Bldg. 45 & Dock 2-B
13. Demol. Conc. Flooring Bldg. 45 & Dock 2-B
- 14a. Off-site Disposal of Wood Flooring
- 14b. Off-site Disposal of Rubble
- 15a. Decon. of Equipment - Bldg. 49
- 15b. Decon. of Eqpt. - Bldg. 45 & Dock 2-B
- 16a. Certification - Inspect/Observe
- 16b. Certification Report





APPROXIMATE SCALE  
 $3/64" = 1' - 0"$



LAYOUT FOR CLOSURE ACTIVITIES  
DOCK 2-B HAZARDOUS WASTE  
STORAGE AREA

BUILDING 26 BAYS AA-1, AA-2 AND AA-3

TO BE CLOSED.  
REMOVE OAK FLOORING.  
WASH CONCRETE.  
REMOVE CONCRETE  
AND SOIL IF NECESSARY,  
AND RESTORE.

FIGURE 6.2

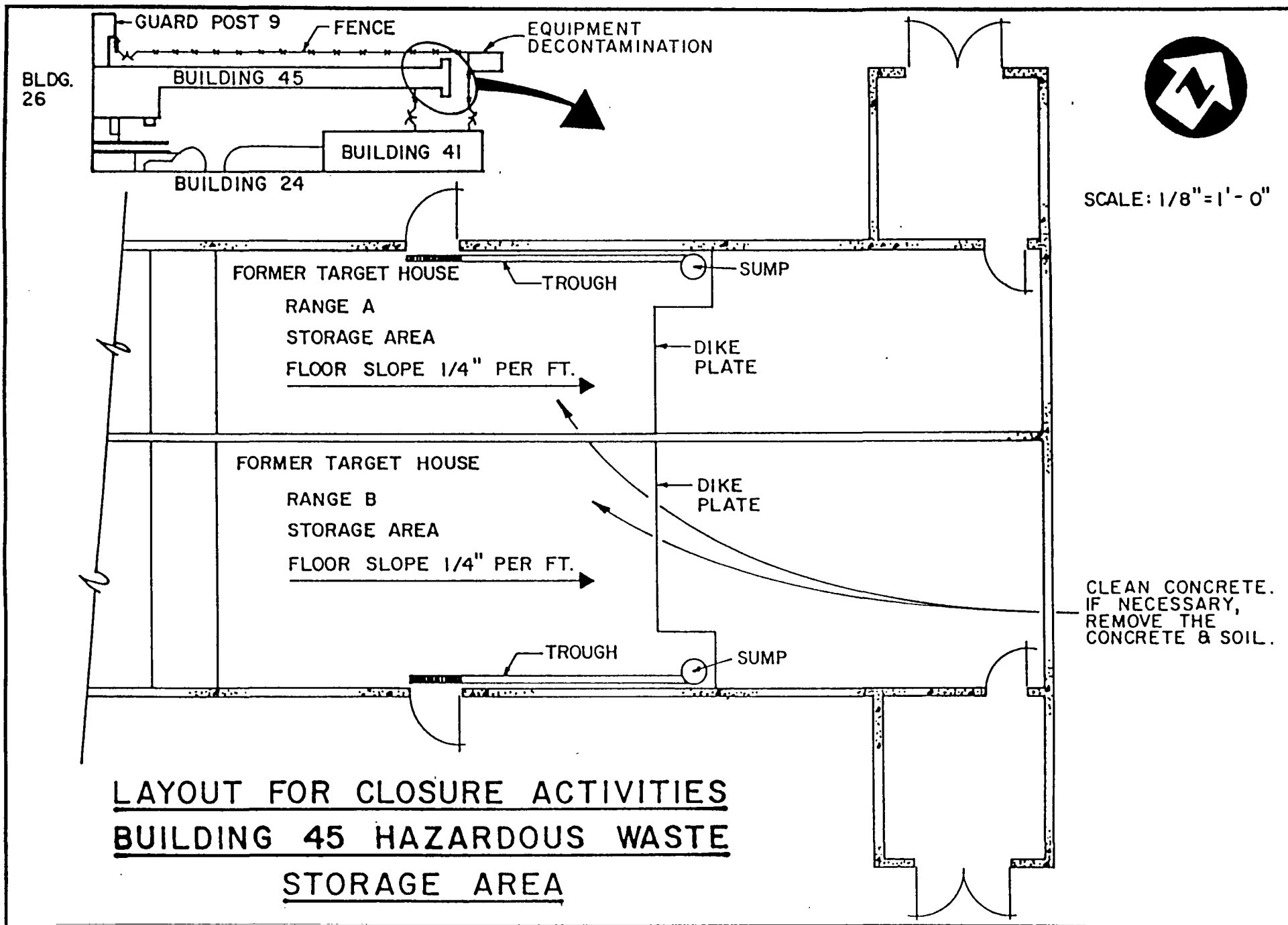
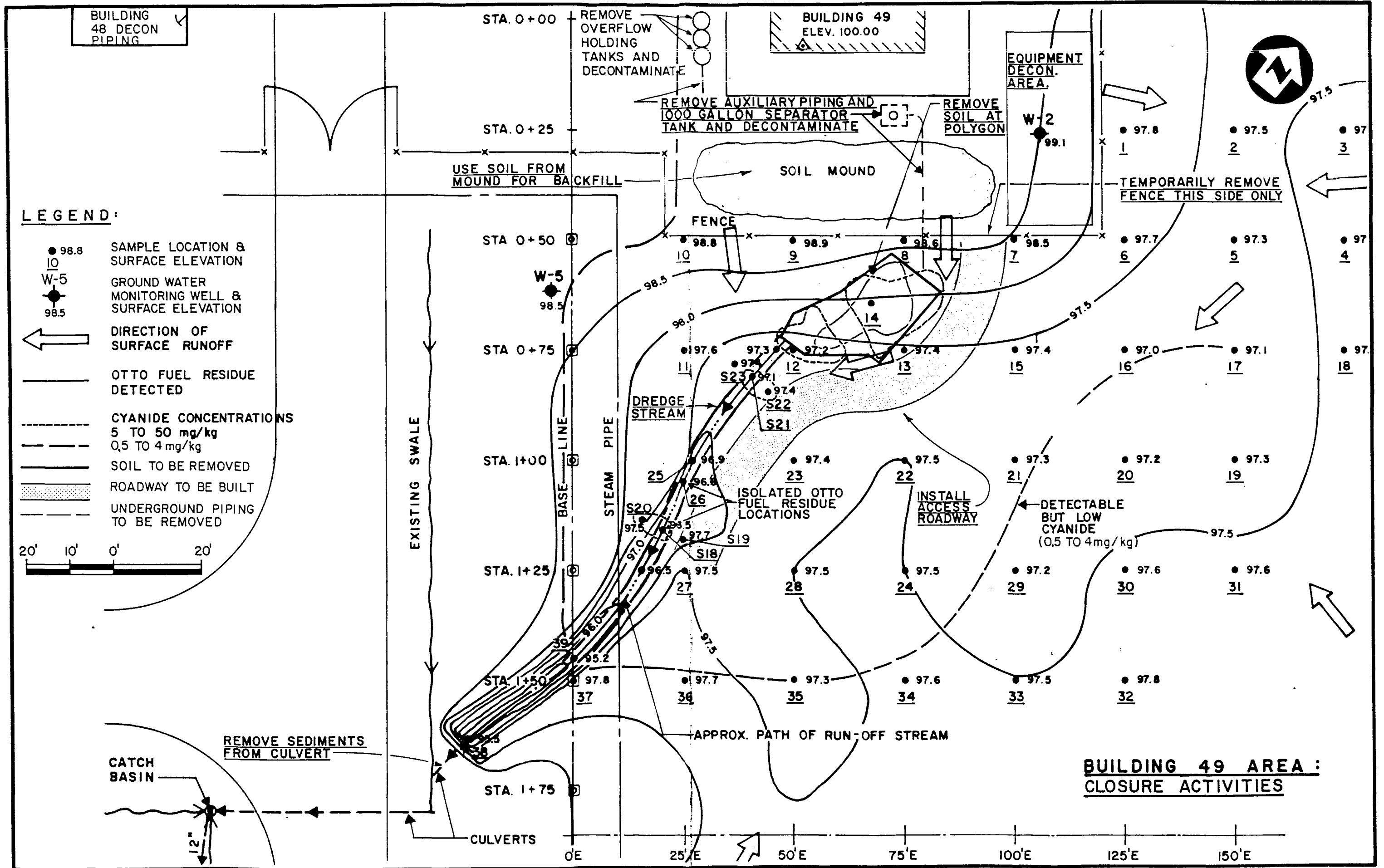
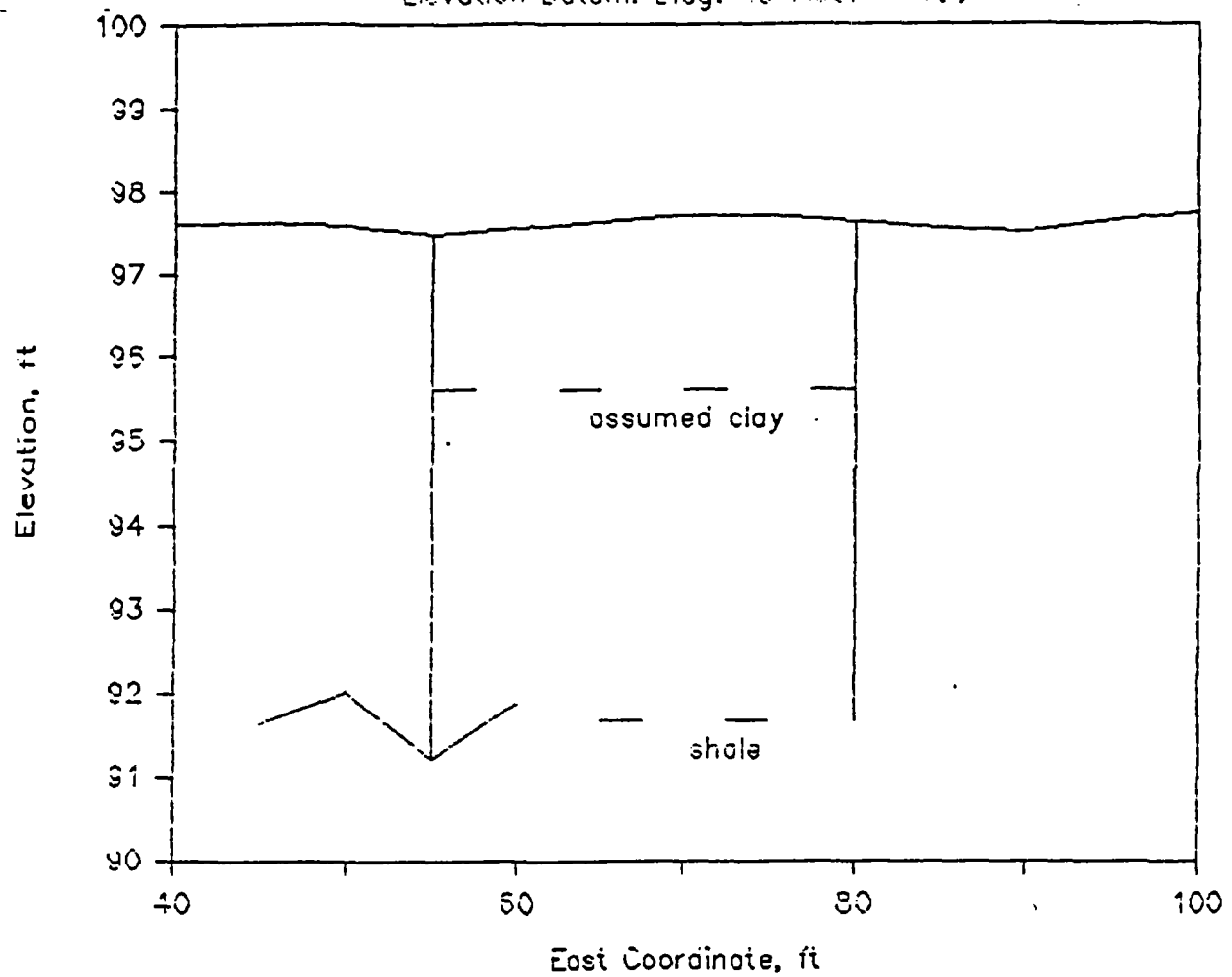


FIGURE 6.3



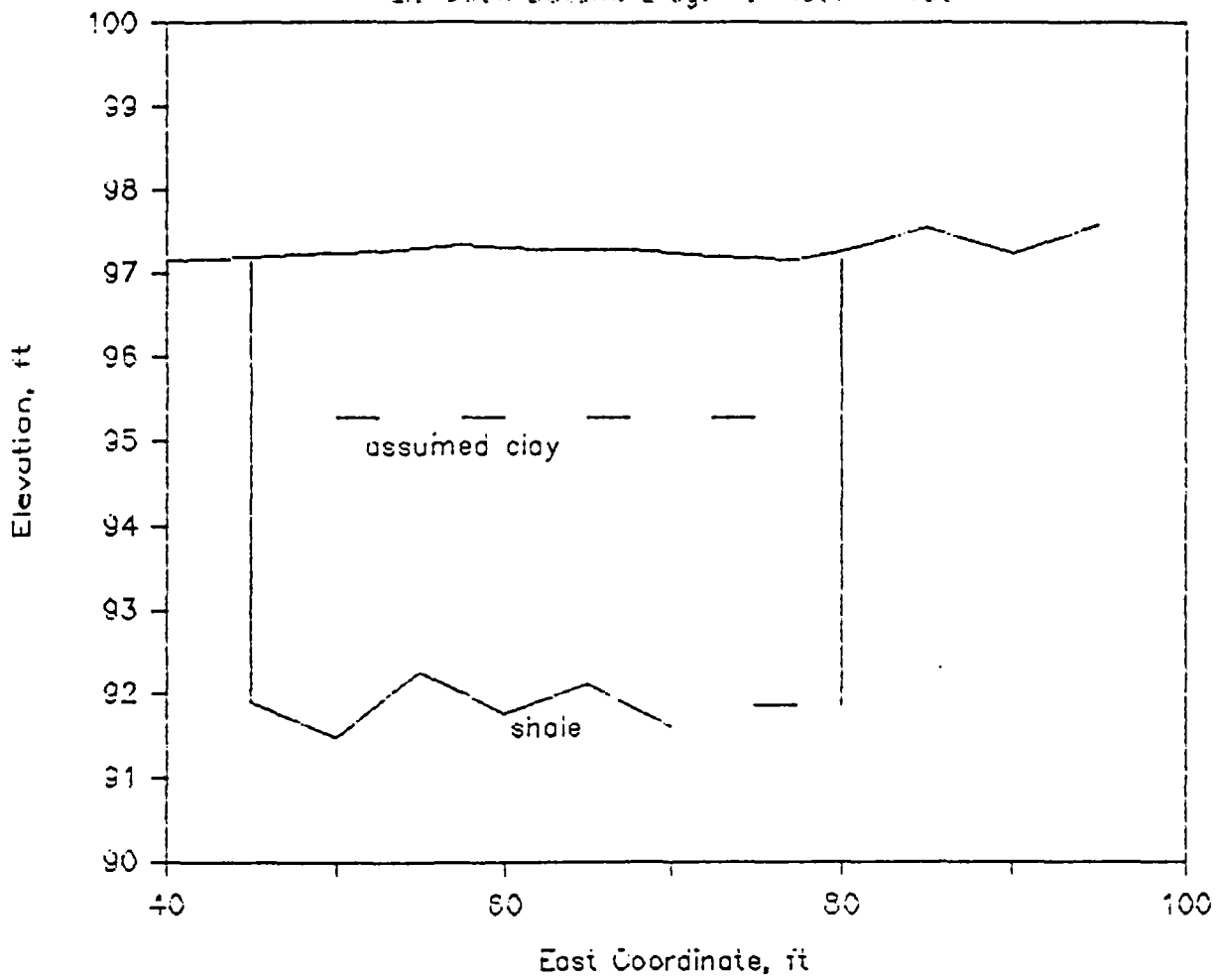
## SECTION THROUGH POLYGON AT SOUTH 60

Elevation Datum: Bldg. 49 Floor = 100'



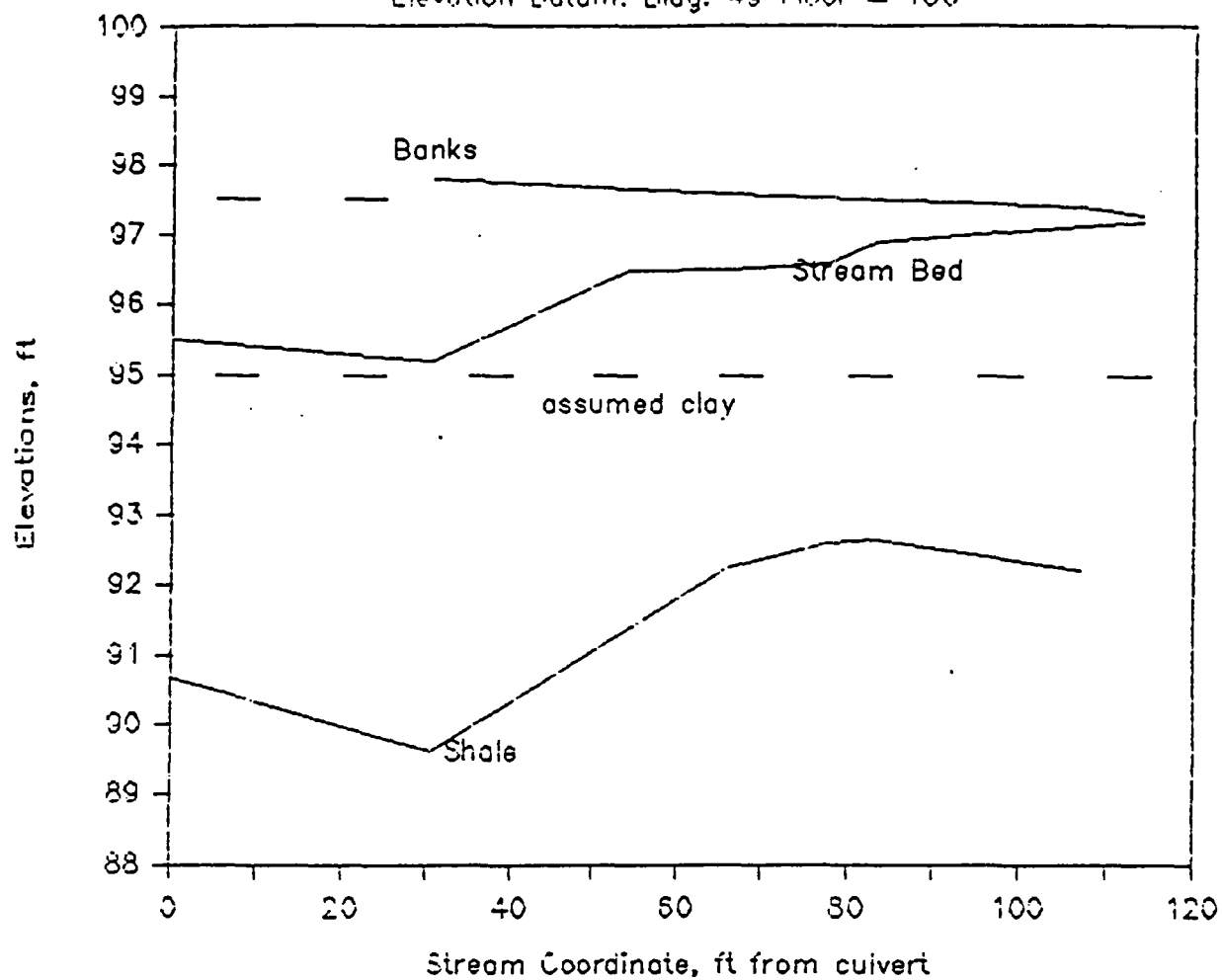
## SECTION THROUGH POLYGON AT SOUTH 70

Elevation Datum: Bldg. 49 Floor = 100'



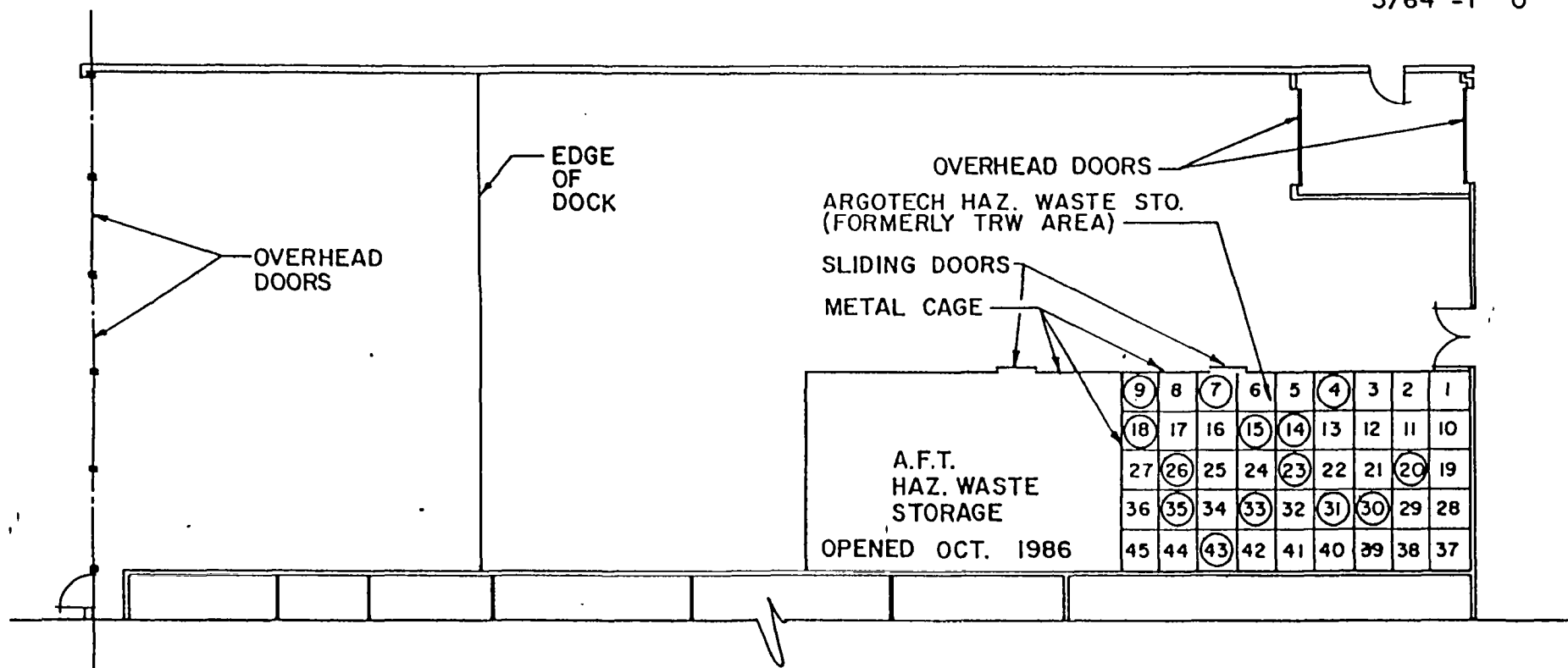
## Runoff Stream Section

Elevation Datum: Bldg. 49 Floor = 100'

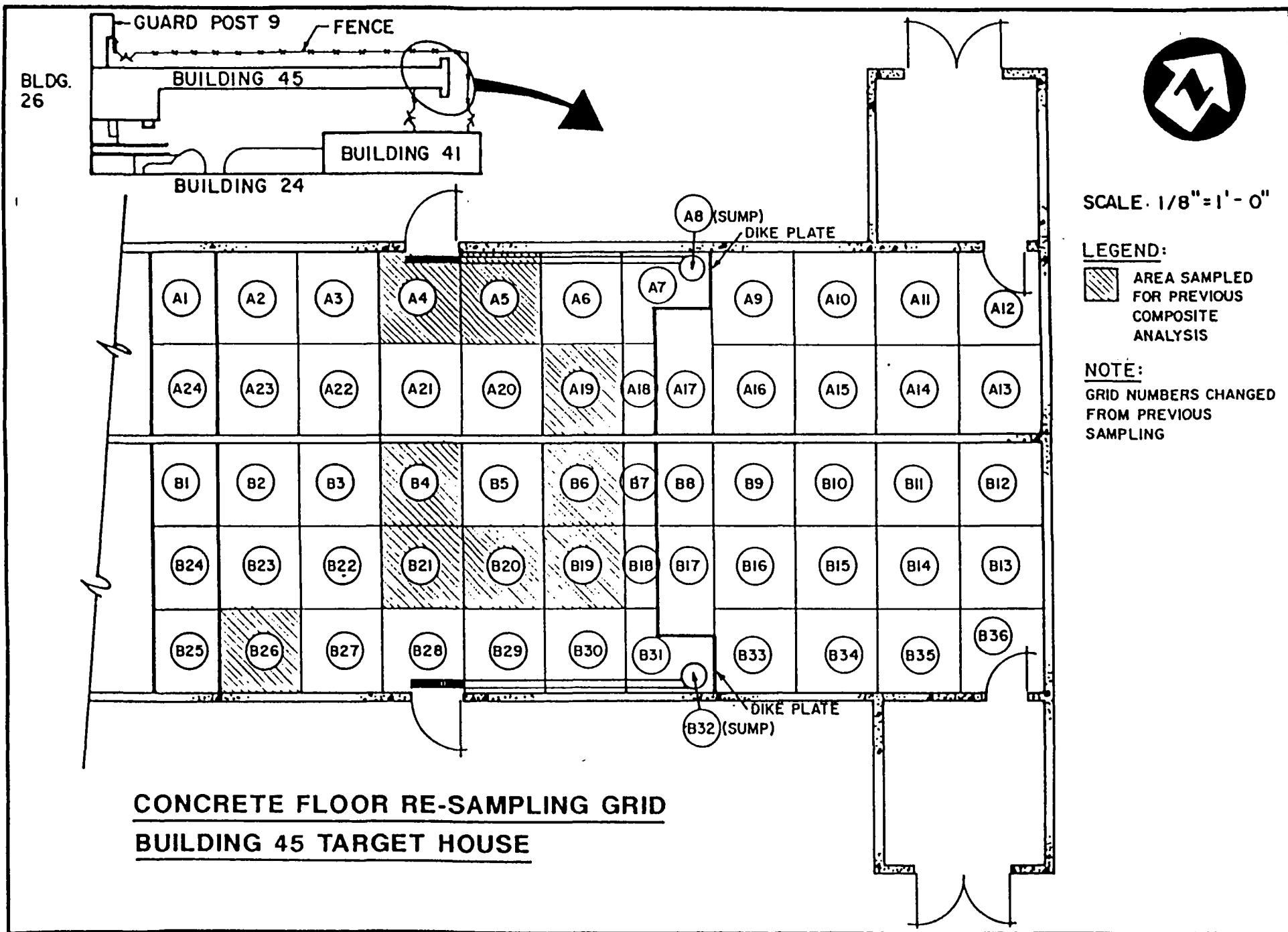




APPROXIMATE SCALE  
3/64" = 1' - 0"



**SAMPLING GRID FOR DOCK 2-B CONCRETE SUB-FLOOR**  
**FORMER TRW HAZARDOUS WASTE STORAGE AREA**  
**BUILDING 26, BAYS AA-1, AA-2 and AA-3**



## 7. AIR EMISSIONS

Engineering controls and precautionary operational practices will be used during closure of the Hazardous Waste Managements Units at the TAPCO site to minimize air emissions of hazardous contaminants.

The soil to be excavated from the torpedo fuel discharge area at Building 49 formerly was swampy. Fugitive dust emissions from that area, which might contain PGDN and/or cyanides, will be controlled by keeping the soil moist. A risk assessment in the Building 49 Study Report (Attachment 2) established that volatilization of PGDN and/or cyanides would not result in harmful concentrations for human populations that might be exposed. However, air monitoring for cyanide emissions will be required during closure activities, and operations will be halted in the event that cyanide concentrations exceed 5 mg/cm<sup>3</sup>.

Demolition of concrete flooring from Dock 2-B and/or the Building 45 Target House are contingent activities, to be undertaken only if efforts to remove hazardous waste residues are not successful. In that event, temporary barriers will be set up, and water will be sprayed on during air-hammering and/or saw cutting, to absorb any dust that might be generated.

## 8. PERSONNEL SAFETY AND FIRE PROTECTION

The Closure Contractor will be required to provide a site-specific Health and Safety Plan, in conformity with the applicable OSHA regulations.

It is anticipated that protective clothing and/or respiratory protection will be required for the following closure activities:

- o Removal of soil and sediments from the Torpedo Fuel Discharge Area near Building 49 and loading into containers could release PGDN and cyanide particles. Equipment operators working in the cabs would require only Level C protection, i.e., air filters. Workers on foot would have to remain upwind from the soil being removed, and use Level B protection, if necessary, i.e., disposable impermeable clothing and supplied air respiration. See Figure 6.4 for layout of closure activities near Building 49.
- o Cleaning the concrete below the existing wood block floor in Building 45 (after removal of the blocks) will require gloves and impermeable clothing.
- o If required, air-hammering and/or saw cutting of the concrete at Dock 2-B could release miscellaneous particles. (These activities would not be required, if cleaning the concrete removes any hazardous residues.) In the absence of any identified toxic constituent present at detectable concentrations, Level C protection would be required, i.e., air filters. See Figure 6.2 for layout of closure activities at Dock 2-B.
- o If required, air-hammering and/or saw cutting of the concrete flooring in Building 45 could release toxic hexavalent chromium particles. (These activities would not be required, if cleaning the flooring removes the absorbed chromium.) Level B protection would be required, i.e., disposable impermeable clothing and supplied air respiration. See Figure 6.3 for layout of closure activities at Building 45.

- o Air monitoring for cyanide emissions will be required during closure activities at the Building 49 site. Operation will be halted in the event that cyanide concentrations exceed  $5 \text{ mg/m}^3$ .

The danger of fire is not imminent. Of all the hazardous waste materials to be handled during closure, only the wood block flooring removed from Dock 2-B would be ignitable under normal conditions. However, in the event of fire at Dock 2-B, other chemicals stored there may be spread or may release toxic materials due to overheating. Containers of such chemicals should be cooled by spraying water over them.

In the event of any plant-wide emergency situation, particularly a fire in the contiguous buildings, closure activity at either Dock 2-B or Building 45 will be halted immediately upon notification by ARGO-TECH's Emergency Coordinator. Similarly, in the event of an emergency situation affecting Building 49, particularly a brush fire, closure activity there will be halted. In either instance, closure equipment will be secured, if possible, and all personnel will leave the area.

## 9. DECONTAMINATION EFFORTS

The 1,000 gallon underground separator tank formerly used to treat discharges of wastewater from torpedo testing operations, the vitreous clay auxiliary piping connecting this tank to Building 49 and to the discharge area, and the three underground holding tanks for torpedo testing wastewater will be unearthed and removed. These items will be taken to Building 48, the former laundry facility for the torpedo test complex, to be washed with a detergent solution (Wisk) and rinsed with city water. The detergent is routinely used for cleaning residues of torpedo fuel during torpedo test operations. This washing and rinsing will be repeated as necessary until the intensely reddish torpedo fuel color is no longer visible. The wash water and rinseate will be collected and disposed of off-site. See Figure 6.4 for layout of closure activities near Building 49.

Decontamination of concrete flooring under Dock 2B and at Building 45 will use three sequential rinses with pressurized water, and scrubbing or scraping, if possible residuals are detected. The rinseates will be retained for off-site disposal and analyzed for volatile solvents (Method 8240) and EP Toxicity Metals.

Decontamination of equipment used in the Closure activities is discussed in Section 14.

## 10. CRITERIA FOR SOIL CONTAMINATION

As indicated in the Schedule for Closure (Section 6), soil sampling will be carried out to ensure that any soil contaminated by hazardous waste generation and 90-day storage activities prior to closure will be removed for appropriate treatment and disposal. The procedures for soil sampling are discussed in Section 11.

It is vital to establish what constitutes a "clean" soil. The hazardous wastes managed at the TAPCO site are known to contain PGDN (torpedo fuel), cyanides and toxic heavy metals. PGDN and Cyanides are not naturally occurring, hence a detectable concentration would indicate contamination. The metals are naturally occurring elements in the area and are anticipated to be present, to some extent, in all soil samples. Detectable below EP-toxic concentrations of Barium, Chromium, Lead and Nickel were leached from soil samples taken near Building 49 (See Table 5.2).

The criterion for cyanide concentration will be 0.25 mg/kg, the detection limit, for soils at Building 45 or at Dock 2-B. However, for soils near Building 49, the criterion will be 10 mg/kg, which was established in a Risk Assessment as not constituting a threat to public health or the environment, specifically for the vicinity of Building 49 (See Attachment 2, the Building 49 Study Report, Appendix C and Appendix D).

The criterion for PGDN concentrations will be its detection limit, i.e., 25 mg/kg.

It is proposed that criteria for metals shall be established based on concentration levels measured on four (4) or more soil samples to be taken at various unaffected locations within the TAPCO site, as follows:

<u>Parameter</u>	<u>Criterion</u>
Cadmium (Cd)	$x_{Cd} + 2.35 s_{Cd}$ (maximum 2.9 ug/kg)
Chromium (Cr)	$x_{Cr} + 2.35 s_{Cr}$ (maximum 23 ug/kg)
Lead (Pb)	$x_{Pb} + 2.35 s_{Pb}$ (maximum 39 ug/kg)
Nickel (Ni)	$x_{Ni} + 2.35 s_{Ni}$

In the above tabulation,  $\bar{x}$  and  $s$ , respectively, stand for the mean and standard deviation of the background values for the subscripted metal. This, in effect, establishes the standard at a concentration statistically greater than background level at about the 5% level of significance, using Student's t-test and assuming three (3) degrees of freedom. (With a larger data base, the level of significance would be lower than 5%.) In the event that the back-ground concentration of a metal exceeds its maximum value as noted above, that maximum value will apply as criterion. The maximum values noted here represent the upper limits of the range for Ohio farm soils.\*

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\* REFERENCE: Logan, T.J. and R.H. Miller, 1983, Background Levels of Heavy Metals in Ohio Farm Soils, Research Circular 275, Ohio State University, Ohio Agricultural Research and Development Center, Wooster, OH)

## 11. SAMPLING PLAN FOR SOIL AND ANALYTICAL METHODS

### 11.1 Building 49 Area

11.1.1 Analysis Parameters and Test Methods. The analysis parameters for the samples of soil and runoff stream sediments and the laboratory methods are as follows:

<u>Parameter</u>	<u>Method No.</u>
Cyanide (Total) PGDN	9010 (SW-846) Chromatographic (See Appendix 3)

These are the parameters used in the previous Building 49 Study (See Attachment 2). RCRA characterization of additional soil samples undertaken to develop this Closure Plan (See Section 5.3) did not reveal any other hazardous waste characteristics. Sediment samples shall be filtered before analysis. Appendix 3 contains details on the PGDN analysis method.

11.1.2 "Clean" Level for Soil. The Risk Assessment (See Appendix C and D of Attachment 2) presents the rationale for establishing what shall be taken to constitute a "clean" level for soil at Building 49. The target concentration levels and the detection limits are as follows:

<u>Parameter</u>	<u>Criterion</u>	<u>Detection Limit</u>
Cyanide (Total) PGDN	10 mg/kg Not Detected	0.5 mg/kg 25 mg/kg

11.1.3 Location of Samples. Figures 11.1 and 11.2 show the locations proposed for soil sampling in the Building 49 Area, to verify that the excavation of soils (for off-site disposal by incineration) has successfully removed residues of the indicator parameters above, to within their respective target concentration levels. As in the previous samplings of soil near Building 49, cells within a grid of numbered 5 ft x 5 ft squares were selected randomly. The Closure activity will sample approximately one cell in four, as follows:

- o The 625 sq.ft. irregular polygon area for soil removal at the former torpedo test wastewater discharge area: 7 cells/29 (Figure 11.1).
- o The 120 ft long runoff stream channel: 6 cells/24 (Figure 11.2).

The soil exposed after removal of the 1,000 gallon separator tank and an estimated 40 ft. of auxiliary piping should be sampled at four locations previously under the tank and at piping connections, if possible, and at sample points spaced about 5 ft.

If necessary (because of damage to the 20 mil plastic sheet), the 25 ft. x 25 ft. container staging area will be sampled using a 7 ft interval grid.

11.1.4 Sampling Methods and Equipment. A Soil Boring rig will be used to take the soil samples near Building 49. The samples will be collected in Shelby Tubes representing 1 ft intervals of depth below the surface. The tubes will be capped, marked with identifying numbers and delivered to a certified laboratory for chemical analysis.

#### 11.2 Plan for Soil Sampling at Dock 2-B and Building 45, If Required

Concrete flooring will be demolished in Building 45 at the specific locations found to contain hazardous waste residues (See Section 6.12). It may also be necessary to demolish the concrete sub-flooring at Dock 2-B, at any specific locations found to contain hazardous waste residues. The surface soils immediately beneath the affected concrete will be inspected and, if necessary, sampled to ensure that no hazardous waste residues remain.

This contingent soil sampling will be limited to the specific parameters which were identified in the analysis of the concrete samples. These soil core samples, if any, will be taken by manually driving 2 inch pipes using a sledge hammer. The test methods for analyzing the parameters will be those provided in U.S. EPA Manual SW-846. Section 10, Criteria for Soil Contamination, presents the rationale for establishing what shall be taken to constitute a "clean" level for soil at the site.

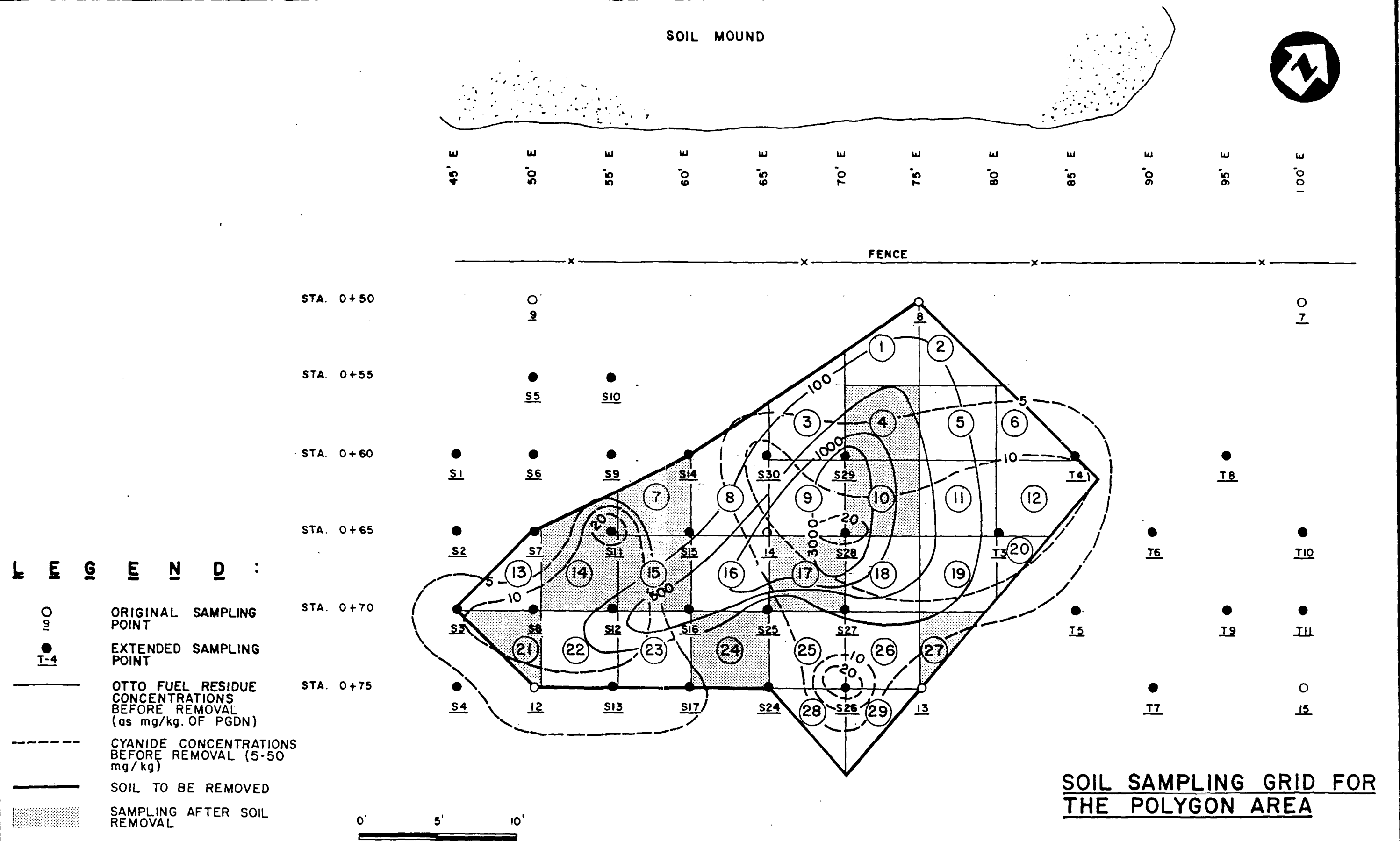
### 11.3 Background Samples

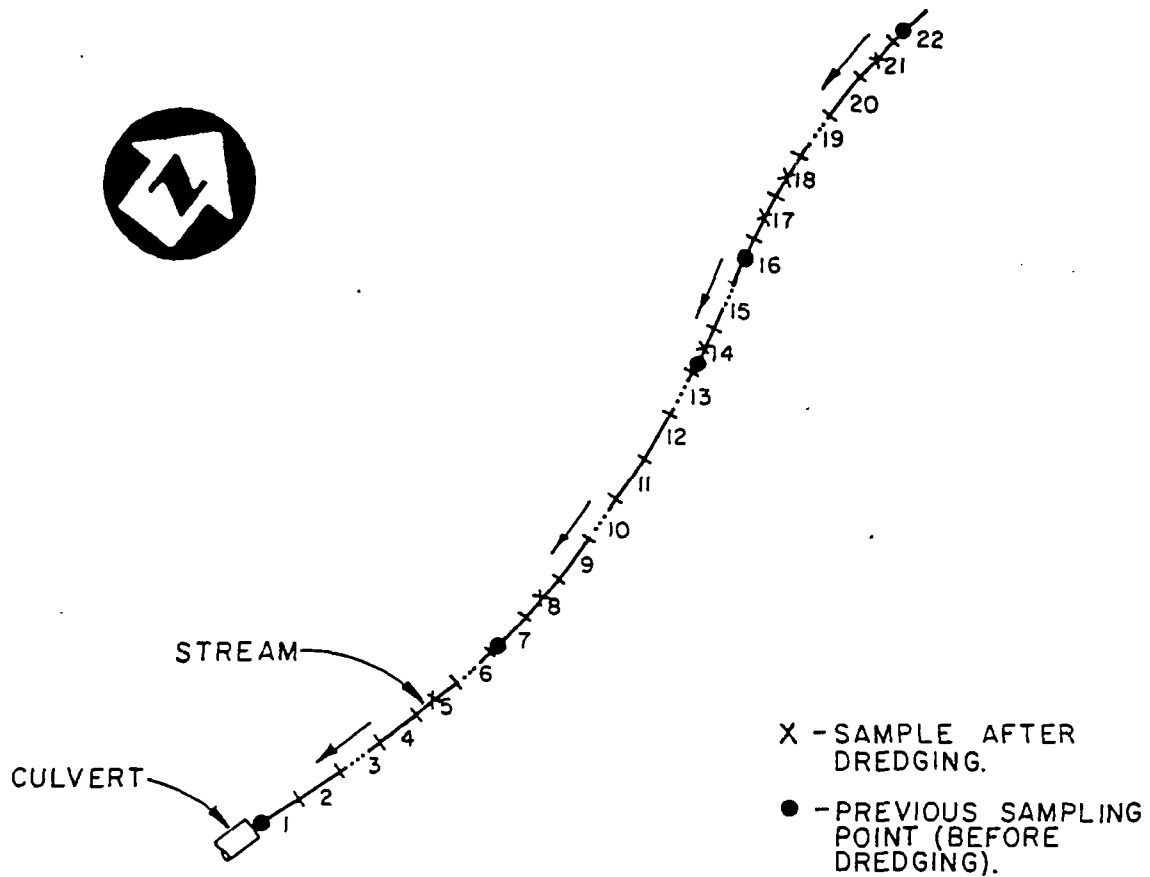
Additional soil sampling will be undertaken by TRW, not later than the beginning of closure activities, to provide a data base of four (4) or more soil samples taken at unaffected locations within the TAPCO site.

### 11.4 Quality Assurance/Quality Control Plan

The soil and sediment sampling plan will include 10% blind duplicates and field blanks, which will be submitted for laboratory analysis along with the regular samples. All sample numbers will be assigned using a sequential code, except for duplicates and blanks, which will be identified as such. Permanent numbered gummed labels and Chain-of-Custody Forms will be provided.

TRW's laboratory services subcontractor will be required to submit details of its analytical Quality Assurance program. This must include procedures for sample acceptance and logging in, quality control (QC) sampling of at least 10 percent (10%) of all logged samples (excepting field blanks and duplicates) for lab duplicate or spike tests. Spike tests shall include matrix spikes and, for GC/MS tests, surrogate spikes. Relative percent deviations for duplicates and spike recoveries shall be reported for all lab QC samples. In addition, laboratory documentation measures will be required to ensure the integrity and legal validity of all analytical results.





PLAN  
1" = 20'

SOIL SAMPLING GRID FOR RUNOFF STREAM  
(NEAR BUILDING 49)

## 12. DESCRIPTION OF REMOVAL EFFORTS

The Closure of the Hazardous Waste Management Unit at Building 49 will excavate soil from the site of discharges of wastewater from torpedo test firings containing cyanides and torpedo fuel residues, for off-site disposal. The Closure of the former TRW Hazardous Waste Storage Area at Dock 2-B will remove wood flooring which was found to contain detectable concentrations of cyanides and priority pollutant organics. The closure of the Units at Building 45 will demolish concrete that contains residues of chromium. If necessary, concrete sub-flooring at Dock 2-B which may be found to contain hazardous waste residues will be demolished. The concrete rubble will be removed for off-site disposal.

The soil and the concrete rubble are solid materials. Laborers will be at hand during all removal and transfer operations to recover any spilled material. The transfer routes will be covered with polyethylene sheet to ensure against loss of spilled material.

Additional details of the Closure Plan which are presented in this Section ensure proper disposal of all such material.

### 12.1 Removal of Soil and Sediments at Building 49

All soil excavated at the Building 49 area will be immediately loaded into containers, which will be transferred to a collection area at the north end of the pavement in the former Torpedo Testing compound. The Collection Area will be protected against contamination by a 20 mil plastic sheet. The containers will be hauled for off-site incineration and disposal, as soon as possible; hence, the maximum number of containers on-site will be about a single hauling load, at most, 20 tons. See Figure 6.4 for layout of facilities near Building 49.

All earthmoving equipment used in these operations will be decontaminated before being allowed to leave the compound area.

### 12.2 Removal of Oak Flooring at Dock 2-B

Wood flooring blocks will be removed from the former TRW Hazardous Waste Storage Area at Dock 2-B. These will be collected immediately in

fibre drum containers, which will be stored at the new or temporary ARGOTECH Hazardous Waste Storage Area at the Dock, in a separate area, until all of the existing flooring in the area to be closed has been removed. Figure 6.2 shows the layout of facilities for closure activities at Dock 2-B.

### 12.3 Removal of Concrete and Soil at Building 45 and/or Dock 2-B, If Required

Rubble from demolition of the concrete at the former TRW Hazardous Waste Storage areas will be transferred to a roll-off container at the site. At Building 45, the container will be located outside the fence to the east of the former Target House. At Dock 2-B, the container will be located inside the building, at the edge of the dock, on street level. See Figures 6.2 and 6.3 for the layout of facilities for closure activities at these units.

The containers will be covered when not in use and will have dust control partitions. The containers will be hauled for off-site disposal at a landfill certified for heavy metals, as soon as possible. Hence, the maximum inventory of concrete rubble or soil on-site will be the roll-off container capacity, about 16 cu.yd.

In the event that hazardous waste residues are detected in the underlying soil after demolition of the concrete, all soil excavated from these areas will be collected, stored on-site and disposed of by off-site landfilling following the procedure outlined above for concrete rubble.

### 13. SPECIFIC CONSIDERATIONS

This section is reserved for details which are specific for Treatment or Disposal facilities. Although TRW's original application included possible treatment, the Hazardous Waste Management Units to be closed have only been storage facilities. Hence, no specific considerations are applicable.

#### 14. DESCRIPTION OF EQUIPMENT CLEANING

All equipment used in the Closure activities will be either steam-cleaned or cleaned with a high pressure water spray before being allowed to leave the site. Temporary enclosures, approximately 25 ft x 50 ft, will be set up, using boards and polyethylene sheet. Condensate or spent spray water will be collected in a holding tank to trap any particles of soil or rubble dislodged from the equipment being cleaned. The holding tank will be cleaned, as necessary, and any solid residue removed from it will be transferred to containers for appropriate off-site disposal as hazardous waste.

The Decontamination Area for closure activities at both Building 45 and Dock 2-B will be in the Dock, near the edge, at building floor level (Figures 6.2 and 6.3). The location for the Decontamination Area for closure activities at Building 49 will be to the east of the building, near the southeast corner of the fence (Figure 6.4).

## 15. CERTIFICATION

TRW Incorporated will retain an independent registered Professional Engineer as an outside consultant, specifically to be present on-site at the former TAPCO site during all of the tasks comprising the Closure Plan and to verify that the activities were conducted in accordance with the Closure Plan which was accepted by the Ohio EPA and the U.S. Environmental Protection Agency.

The Engineer's report will be submitted to the Ohio EPA and the U.S. Environmental Protection Agency by TRW Incorporated.

## 16. STATUS OF THE FACILITY AFTER CLOSURE

The Closure of Hazardous Waste Management Units at Dock 2-B, Building 45 and Building 49 will be a complete closure. None of the units will be subject to requirements for Post-Closure inspection and maintenance or to requirements for ground water protection.

APPENDIX 1

RCRA INTERIM STATUS PERMIT FOR THE TAPCO FACILITY



UNITED STATES  
ENVIRONMENTAL PROTECTION AGENCY  
REGION V

111 West Jackson Blvd.  
CHICAGO, ILLINOIS 60604

REPLY TO ATTENTION OF:  
RCRA ACTIVITIES

MAY 14 1982

Andrew Resetar, Design Engineer  
TRW Incorporated  
23555 Euclid Avenue  
Cleveland, Ohio 44117

RE: Interim Status Acknowledgement      USEPA ID No. OHD 004 179 453  
FACILITY NAME: TRW INC

Dear Mr. Resetar:

This is to acknowledge that the U.S. Environmental Protection Agency (USEPA) has completed processing your Part A Hazardous Waste Permit Application. It is the opinion of this office that the information submitted is complete and that you, as an owner or operator of a hazardous waste management facility, have met the requirements of Section 3005(e) of the Resource Conservation and Recovery Act (RCRA) for Interim Status. However, should USEPA obtain information which indicates that your application was incomplete or inaccurate, you may be requested to provide further documentation of your claim for Interim Status. Our opinion will be reevaluated on the basis of this information.

As an owner or operator of a hazardous waste management facility, you are required to comply with the interim status standards as prescribed in 40 CFR Parts 122 and 265, or with State rules and regulations in those States which have been authorized under Section 3006 of RCRA. In addition, you are reminded that operating under interim status does not relieve you from the need to comply with all applicable State and local requirements.

The printout enclosed with this letter identifies the limit(s) of the process design capacities your facility may use during the interim status period. This information was obtained from your Part A Permit application. If you wish to handle new wastes, to change processes, to increase the design capacity of existing processes, or to change ownership or operational control of the facility, you may do so only as provided in 40 CFR Sections 122.22 and 122.23.

As stated in the first paragraph of this letter, you have met the requirements of 40 CFR Part 122.23; your facility may operate under interim status until such time as a permit is issued or denied. This will be preceded by a request from this office or the State (if authorized) for Part B of your application. Please contact Arthur Kawatachi of my staff at (312) 886-7449, if you have any questions concerning this letter or the enclosure.

Sincerely yours,

Karl J. Klepitsch, Jr., Chief  
Waste Management Branch

Enclosure

cc: G. E. Schrader

June 6, 1983

Mr. T. Crepeau  
Division of Permits and Manifest Records  
P. O. Box 1049  
361 East Broad Street  
Columbus, Ohio 43215

Dear Mr. Crepeau:

The original Resource Conservation and Recovery Act (RCRA) Part A permit application included information regarding a waste treatment system located at TRW's Euclid, Ohio facility (Items 1 through 10, inclusive, Page 1 of 5). This waste treatment system treats acid, alkali, chromium and cyanide wastes generated by electroplating and metal finishing operations. Due to revisions in RCRA and the fact that the waste treatment system's discharge is regulated by a National Pollutant Discharge Elimination System permit (OH0000281), said information has been removed from the Part A application.

The following revisions were also made to the application:

- 1) Removed information regarding a 1, 1, 1 - trichloroethane still recovery/recycling system (Section III C, Page 2 of 5).
- 2) Added D008 hazardous waste (Item 4, Page 3 A of 5).
- 3) Increased amount of "D002" solid corrosive material (Item 2, Page 3A of 5).
- 4) Added a hazardous waste storage area (Item 5, Page 1 of 5).

Mr. T. Crepeau  
June 6, 1983  
Page 2

- 5) Added treatment rate for Otto fuel dewatering tank (Item 7, Page 1 of 5).
- 6) Removed treatment designation from Item 1, Page 3A of 5 since material is beneficially reused.

The amended application is hereby submitted for your records.  
Please advise me if you have any questions.

Respectfully,



Andrew L. Resetar  
Plant Engineering Department

Attachment  
cc: RCRA Activities  
USEPA  
Region V

ALR/i

1938-1988



WADSWORTH/ALERT  
LABORATORIES, INC.

Sampling, testing, mobile labs

4101 Shuffel Drive N.W. / North Canton, Ohio 44720

Samples were periodically spiked with the "standard" PGDN to determine extraction efficiency and analytical accuracy. The quantitation limit was set at 20% of a standard giving a half scale response. Blanks were also analyzed and were determined to be clean if no quantifiable PGDN was present.

This should suffice as a summary of the method. If you have any questions feel free to call me.

Sincerely,

WADSWORTH/ALERT LABORATORIES, INC.

Marvin W. Stephens, Ph.D.

Vice President

Corporate Technical Director

MWS:pjh



CORPORATE AND LABORATORY: North Canton, Ohio (216) 497-9396  
LABORATORY: Cleveland, Ohio (216) 642-9151  
LABORATORY: Bartow, Florida (813) 533-2150  
SOUTHEAST REGIONAL OFFICE: Lexington, South Carolina (803) 957-6590  
24-HOUR ALERT LINE (216) 497-9338

November 14, 1980

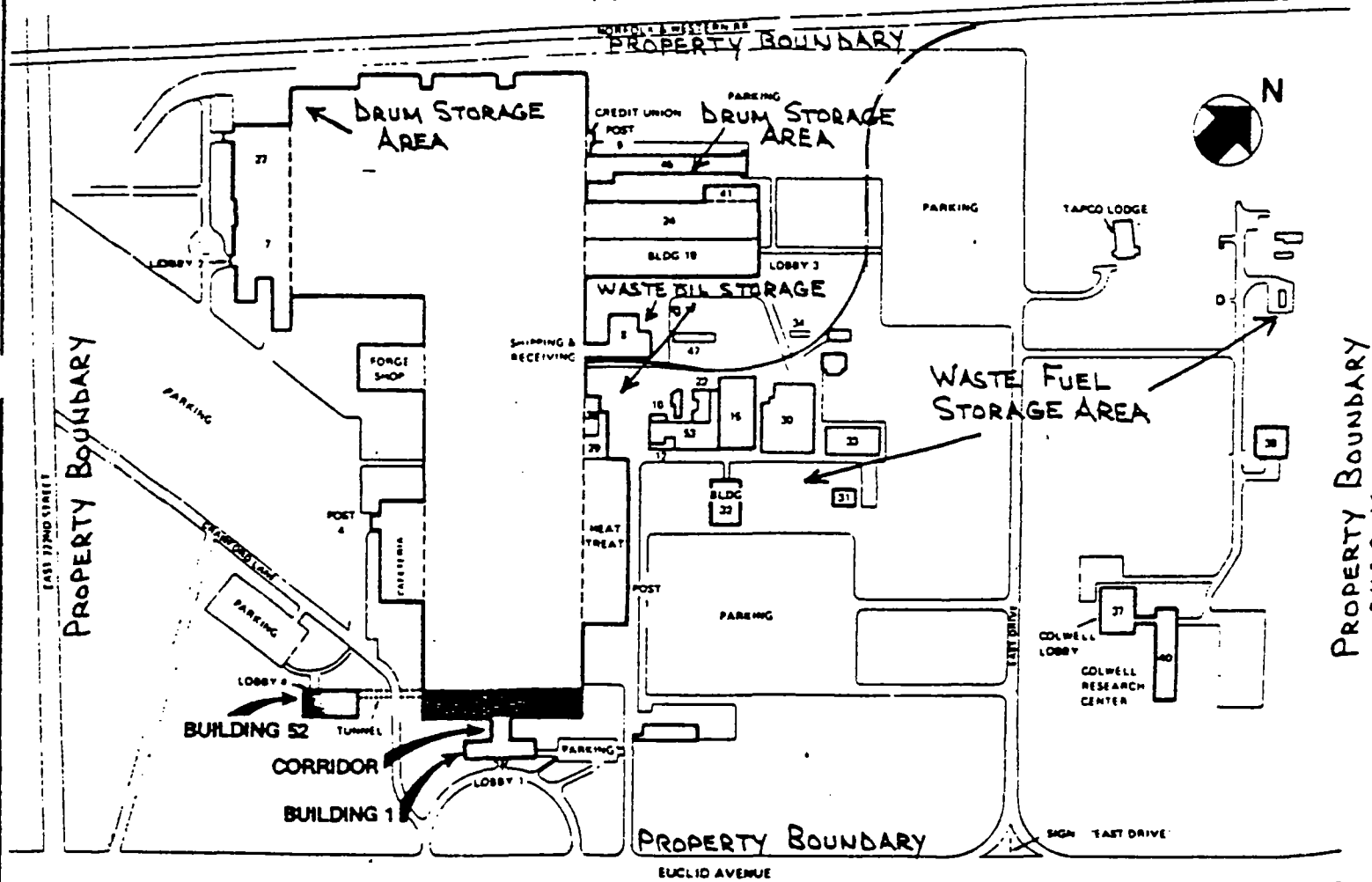
ATTACHMENT "A"

Y. J. Kim  
EPA Region V  
RCRA Activities  
P.O. Box 7861  
Chicago, Illinois 60680

Please be advised that a solid corrosive material is generated from metal finishing operations at this plant. This statement is intended to notify you that an appropriate EPA Hazardous Waste Number is not included in Part 261. The estimated annual quantity of this waste is 250 tons.

# TRW EUCLID PROPERTY

4000 FT



APPENDIX 2  
ENVIRONMENTAL SETTING OF THE TAPCO FACILITY

## **Introduction**

The purpose of this section is to describe the regional conditions of geology which are likely to occur in the immediate vicinity of the TAPCO facility and how those conditions affect the groundwater geology. This report is based on public and private data sources which are readily available. It should be noted that available data is regional in nature and local conditions may differ from those reported in the literature. Data has been obtained from several government agencies and private sources. These data include: maps depicting geologic conditions in the Cuyahoga County area; a detailed soil survey of the mentioned county; and several water well boring logs in proximity to the study area. In addition to this, topographic maps and aerial photos have been secured to aid in the groundwater flow investigation.

## **Regional Subsurface Geology**

Based on observations of the Map of Consolidated Material in Cuyahoga County, Ohio by the State of Ohio Department of Natural Resources (1952), the following generalized statement can be made. The site upon which the TAPCO facility is situated is underlain by a series of shale formations of very low permeability and of Mississippian and Devonian age which are in excess of 800 feet thick. These formations from oldest to youngest and therefore bottom to top are the Chagrin Shale, the Ohio Shale and the Bedford Shale.

The Chagrin Shale is a blue-gray to dark gray silty shale with scattered light blue-gray iron carbonate concretions and thin, hard, light gray calcareous sandstone layers. The Ohio Shale with the local member Cleveland Shale is a massive black bituminous shale containing pyrite concretions. The Ohio Shale unconformably lies on the Chagrin Shale, both of which are Devonian in age. The youngest of these formations and the closest to the surface is the Bedford Shale. This formation is a soft, blue-gray shale with thin calcareous sandstone lenses which thicken locally to form the basal Euclid sandstone member. This Euclid member is of special concern to this project do to its properties of high porosity and permeability.

In certain areas these formations are unproductive of groundwater. However, domestic supplies of 3 to 4 gallons per minute may be developed. These wells would have to be much deeper than wells with similar yields in other aquifers.

The general structural attitude of the bedrock is flat with no major tectonic deformation activity.

### **Pleistocene Geology and Landforms**

Pleistocene geology is geology of relatively recent times and events. It, therefore, has shaped and has a cause/effect relationship to our present day landform situation. There are three main features at or near the location of the TAPCO plant which are a result of Pleistocene geologic activity. These features play a prominent role in the definition of groundwater flow direction.

One feature is the generally flat broad plain which is a result of clay, silt and fine sands being deposited in a earlier stage of glacial lake inundation. Deposits are generally thin and underlain by glacial till except in buried valleys where thickness will be greater. This generally is a very poor source of groundwater. These deposits have been transforming for ten thousand years into today's soil types. This report will elaborate further on this matter.

Ancient beach ridges are another feature and are the result of wave dominated depositional action and consist of sand and gravel deposited at the ancient lake shoreline. These beaches are generally not more than 20 feet thick. Water supplies are usually small. Because of their porous nature these ridges are of important concern especially if they are associated with contamination by hazardous materials. They are a separate geologic entity which would necessitate independent study and surveillance. Locations of these beach ridges according to referenced maps are shown in Figure 2.

The most visually prominent feature is the Lake Cliffs. As one stands on the TAPCO Property looking in a Southeasterly direction, a definite and abrupt increase in topographic relief can be observed. This is the Lake Cliffs which were formed by a glacial lake cutting into a previously deposited shale or clay unit, forming the truncated feature. The importance of this feature is that it provides a probable hydraulic upgradient location from which to base groundwater background studies.

average depth of thirty-four inches and is a grayish brown, firm, shaly silty clay. Areas of the Hornell soil that are not drained have a perched seasonal high water table at a depth of twelve to thirty inches in winter, spring, and during extended wet periods. Permeability is very slow. Run off is very rapid. The Hornell soil has a low available water capacity. The subsoil is strongly acidic to very strongly acidic.

Only with onsite investigation can any totally accurate site-specific comments be made about the soil conditions, aerial extents and confining boundaries.

#### **Aerial Photos, Topography and Groundwater Flow**

Aerial photos dated April, 1978, were used to determine the topographic relief gradient of the TAPCO property. The actual photos were obtained from Graphco, Base Resource Division, a map supply company in Cleveland. The photos used had topographic information superimposed onto them by photogrammetric methods. This allows for a greater degree of accuracy to be employed while viewing. The USGS topographic map does not have this degree of detail.

Generally, the highest elevations are along a line parallel and adjacent to Euclid Avenue, on the Southwest boundary of the property. The lower elevations are along the Northwest boundary. A topographic cross section was constructed from the aerial photos and is given in Figure 3. Figure 4 shows the location of the cross section. The highest elevation on the property in this line of cross section is approximately 686 feet. The lowest elevation is 647 feet. This is an elevation difference of 39 feet. Most of the topography is very flat. On the cross section near building no. 37, the surface is very flat as the line of cross section is followed to the northwest.

It should be noted that a check for additional vintages of air photos was made with the USGS. Other vintages do exist; however, none are significantly different from the 1978 photos used for this report.

Overall groundwater flow is expected to be southeast to northwest as a result of the topographic relief gradient dip direction. The rate at which the groundwater flows is yet to be determined. however, it is expected to be very slow, based on the Cuyahoga County soils report.

## Soils

The soils portion of this report is based upon a soil survey of Cuyahoga County, Ohio, done by the Soil Conservation Services, et.al. (1977). There are basically three distinct mappable soil units present on the TAPCO premises. The nomenclature for the three units to be discussed is Ub-urban land, Uc-urban land-Allis complex, and HsC-Hornell-Urban land complex, rolling.

The majority of the soil on the property is considered to be Ub. Urban land is areas where more than 80 percent of the surface is covered by asphalt, concrete, buildings or other manmade surfaces. These areas are usually in excess of 10 acres and are nearly level to gently sloping. Examination and identification of soils or soil like materials in this unit are difficult at best, and impractical for the scope of the report from which this information is being drawn. Onsite investigation is needed to determine specific local conditions in this category.

A relatively small area in the Northeast portion of the property being scrutinized is designated as Uc-Urban land-Allis complex. This unit is comprised of urban land and a moderately deep, nearly level and gently sloping, poorly drained Allis soil. Typically, the Allis soil has a surface layer of dark grayish brown, friable silt loam which is about six inches deep. The subsoil is approximately twenty-seven inches in depth and is a grayish brown, mottled, very firm silty clay. The substratum is dark gray rippable, partially weathered shale bedrock. Most of this area is artificially drained. Undrained areas of Allis soil have a perched seasonal high water table near the surface in Fall, Winter, Spring and, of course, during extended wet periods. Permeability is slow or very slow, and runoff is slow. Other characteristics of this unit are: a low available water capacity, a moderate shrink-swell potential, and an extremely acid to strongly acidic subsoil.

The third major soil unit at the TAPCO property is HsC-Hornell-Urban land complex, rolling. This unit consists of a rolling Hornell soil that is moderately deep and somewhat poorly drained. This mappable entity runs parallel to Euclid Avenue on the Southeast boundary of the TAPCO plant. Typically the Hornell soil has a surface layer of dark grayish brown, friable silt loam about six inches thick. The subsoil is about twenty inches thick. It is a yellowish brown and grayish brown, mottled, firm, silty clay loam and silty clay. The substratum goes to an

APPENDIX 3

LABORATORY ANALYSIS METHOD FOR PROPYLENE GLYCOL DINITRATE

1938-1988



WADSWORTH/ALERT  
LABORATORIES, INC.

Sampling, testing, mobile labs

4101 Shuffel Drive N.W. / North Canton, Ohio 44720

September 16, 1988

RECEIVED

SEP 19 1988

CLEVELAND ES

Engineering Science LTD.  
19101 Villaview Rd.  
Suite 301  
Cleveland, Ohio 44119

Attention: Richard Prober

Dear Richard,

In response to your question concerning the method used to analyze the Otto fuel component propylene glycol dinitrate, I am submitting the following summary:

#### Propylene Glycol Dinitrate Analytical Summary

Extraction was performed using a soxhlet extractor for 18 hours with methylene chloride as the solvent. This extraction is similar to Method 3540 without the addition of any surrogate standards. Extracts were concentrated to 10 ml. for analysis.

The analysis was performed using a gas chromatograph equipped with a flame ionization detector. The column was a 30 meter DB-1 megabore, 0.53 mm with nitrogen carrier gas. A temperature was programmed from 60° to 120°C.

External standards were used to quantify results. The sample extract was initially analyzed and quantified against a single point calibration. If the initial analysis was outside a 50-200% limit of the prepared standard, the sample extract was diluted or concentrated to meet this criteria. A standard was rerun every 3-5 runs to assure consistent response. The standard was derived from a sample of Otto fuel supplied by TRW and was assumed to be 76% propylene glycol dinitrate (PGDN) as described in its specifications. Because of the nature of the standard no further standardization was performed.



CORPORATE AND LABORATORY: North Canton, Ohio (216) 497-9396  
LABORATORY: Cleveland, Ohio (216) 642-9151  
LABORATORY: Bartow, Florida (813) 533-2150  
SOUTHEAST REGIONAL OFFICE: Lexington, South Carolina (803) 957-6590  
24-HOUR ALERT LINE (216) 497-9338

TRW INC

OHD 004 179 453

FACILITY OPERATOR

TRW INC

FACILITY OWNER

TRW INC

FACILITY LOCATION23555 EUCLID AVE  
CLEVELAND

OH 44117

PROCESS CODEDESIGN CAPACITYUNIT OF MEASURE

S02	55800.00000	G
S01	27500.00000	G
T01	1210000.00000	U
T03	54.00000	E

## ----- KEY -----

PROCESS	PRO- CESS CODE	APPROPRIATE UNITS OF MEASURE	UNIT OF MEASURE	CODE
STORAGE:				
CONTAINER	S01	G or L	GALLONS	G
TANK	S02	G or L	LITERS	L
WASTE PILE	S03	Y or C	CUBIC YARDS	Y
SURFACE IMPOUNDMENT	S04	G or L	CUBIC METERS	C
DISPOSAL:			GALLONS PER DAY	U
			LITERS PER DAY	V
			TONS PER HOUR	D
			METRIC TONS/HOUR	W
INJECTION WELL	D79	G, L, U, or V	GALLONS/HOUR	E
LANDFILL	D80	A or F	LITERS/HOUR	H
LAND APPLICATION	D81	B or Q	ACRE-FEET	A
OCEAN DISPOSAL	D82	U or V	HECTARE-METER	F
SURFACE IMPOUNDMENT	D83	G or L	ACRES	B
TREATMENT:			HECTARES	Q
			POUNDS/HOUR	J
TANK	T01	U or V	KILOGRAMS/HOUR	R
SURFACE IMPOUNDMENT	T02	U or V	TONS PER DAY	N
INCINERATOR	T03	D, W, E, or H	METRIC TONS/DAY	S
OTHER	T04	U, V, J, R, N, or S		

1  
GENERAL

## GENERAL INFORMATION

Consolidated Permits Program  
(Read the "General Instructions" before starting)

F O H D 0 0 4 1 7 9 4 5 3

## GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI (except VI-B which must be completed regardless). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

PLEASE PLACE LABEL IN THIS SPACE

## II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column. If the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK "X"			SPECIFIC QUESTIONS	MARK "X"		
	YES	NO	FORM ATTACHED		YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X			D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		X	F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

## III. NAME OF FACILITY

1	SKIP	TRW INC
---	------	---------

## IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)				B. PHONE (area code & no.)			
2	RESETAR	ANDREW	DESIGN ENGINEER	216	692	5475	

## V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX				B. CITY OR TOWN		C. STATE	D. ZIP CODE
3	23555	EUCLID	AVENUE	CLEVELAND		OH	44117

## VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER				B. COUNTY NAME		C. CITY OR TOWN		D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
5	23555	EUCLID	AVENUE	CUYAGOGA		CLEVELAND		OH	44117	

<b>A. FIRST</b> 7 2 4 (specify) Aircraft Engine Components (Metal Finishing)	<b>B. SECOND</b> 7 (specify)
<b>C. THIRD</b> (specify)	<b>D. FOURTH</b> 7 (specify)

**OPERATOR INFORMATION**

**A. NAME**

TRW INC

Is the name listed in Item VIII-A also the owner?  
☒ YES ☐ NO

**C. STATUS OF OPERATOR** (Enter the appropriate letter into the answer box; if "Other", specify.)

F - FEDERAL  
 S - STATE  
 P - PRIVATE

M - PUBLIC (other than federal or state)  
 O - OTHER (specify)

P

(specify)

**D. PHONE** (area code & no.)

A

2 1 6

6 9 2

5 4 7 5

**E. STREET OR P.O. BOX**

2 3 5 5 5 EUCLID AVENUE

**F. CITY OR TOWN**

CLEVELAND

**G. STATE**

OH

**H. ZIP CODE**

4 4 1 1 7

**IX. INDIAN LAND**

Is the facility located on Indian lands?

☐ YES

☒ NO

**EXISTING ENVIRONMENTAL PERMITS**

**A. NPDES (Discharges to Surface Water)**

OH 0 0 0 0 2 8 1

**D. PSD (Air Emissions from Proposed Sources)**

P N A

**B. UIC (Underground Injection of Fluids)**

U N A

**E. OTHER (specify)**

N A

(specify)

N A

**C. RCRA (Hazardous Waste)**

R N A

**E. OTHER (specify)**

N A

(specify)

N A

**MAP**

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

**NATURE OF BUSINESS** (provide a brief description)

Manufacture aircraft engine components.

**CERTIFICATION** (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and its attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in this application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

**A. NAME & OFFICIAL TITLE** (type or print)

F. J. Rechin

**B. SIGNATURE**

*[Signature]*

**C. DATE SIGNED**

5/1/13

**REMARKS FOR OFFICIAL USE ONLY**

## HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

EPA I.D. NUMBER

1 OH D 0 0 4 1 7 9 4 5 3

RCRA

## FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr. mo. & day)

COMMENTS

## FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

## A. FIRST APPLICATION (place an "X" below and provide the appropriate date)

☐ 1. EXISTING FACILITY (See instructions for definition of "existing" facility. Complete item below.)

☐ 2. NEW FACILITY (Complete item below.)

FOR NEW FACILITIES  
PROVIDE THE DATE  
(yr., mo., & day) OPER-  
TION BEGAN OR IS  
EXPECTED TO BEGIN

FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day)  
OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED  
(use the boxes to the left)

## B. REVISED APPLICATION (place an "X" below and complete item 1 above)

☒ 1. FACILITY HAS INTERIM STATUS

☐ 2. FACILITY HAS A RCRA PERMIT

## III. PROCESSES - CODES AND DESIGN CAPACITIES

A. PROCESS CODE - Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process (including its design capacity) in the space provided on the form (Item III-C).

B. PROCESS DESIGN CAPACITY - For each code entered in column A enter the capacity of the process.

1. AMOUNT - Enter the amount.

2. UNIT OF MEASURE - For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER (barrel, drum, etc.)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS

Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET (the volume that would cover one acre to a depth of one foot) OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

## Treatment:

TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided: Item III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	S
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING ITEM III (shown in line numbers X-1 and X-2 below): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

A. PROCESS CODE (from list above)		B. PROCESS DESIGN CAPACITY		FOR OFFICIAL USE ONLY		A. PROCESS CODE (from list above)		B. PROCESS DESIGN CAPACITY		FOR OFFICIAL USE ONLY	
1. AMOUNT (specify)		2. UNIT OF MEASURE (enter code)				1. AMOUNT		2. UNIT OF MEASURE (enter code)			
S 0 2	600	G				S 0 1	23,100	G			
T 0 3	20	E				S 0 2	30,000	G			
S 0 2	30,000	G				T 0 1	3	U			
O 2	1,000	G									
O 2	2,000	G									
O 1	4,400	G									

## III. PROCESSES (continued)

SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

N/A

## IV. DESCRIPTION OF HAZARDOUS WASTES

**A. EPA HAZARDOUS WASTE NUMBER** — Enter the four-digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four-digit number(s) from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

**B. ESTIMATED ANNUAL QUANTITY** — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

**C. UNIT OF MEASURE** — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE      CODE  
POUNDS      P  
TONS      T

METRIC UNIT OF MEASURE      CODE  
KILOGRAMS      K  
METRIC TONS      M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

## D. PROCESSES

### 1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous waste: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

**2. PROCESS DESCRIPTION:** If a code is not listed for a process that will be used, describe the process in the space provided on the form.

**NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER** — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

- Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
- In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
- Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

**EXAMPLE FOR COMPLETING ITEM IV (shown in line numbers X-1, X-2, X-3, and X-4 below)** — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARDOUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES	
				1. PROCESS CODES (enter)	2. PROCESS DESCRIPTION (If a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

EPA I.D. NUMBER (enter from page 1)															FOR OFFICIAL USE ONLY									
<div style="display: flex; justify-content: space-between;"> <span>W O H D 0 0 4 1 7 9 4 5 3</span> <span>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15</span> </div>															<div style="display: flex; justify-content: space-between;"> <span>W</span> <span>DUP</span> <span>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15</span> </div>									

**IV. DESCRIPTION OF HAZARDOUS WASTES (continued)**

Z	A. EPA HAZARD. WASTE NO. (enter code)				B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES								2. PROCESS DESCRIPTION (If a code is not entered in D(1))															
	1	2	3	4			1. PROCESS CODES (ENMT)																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	D	0	0	1	410		T	S	0	2																				
2	D	0	0	2	500 *		T	S	0	1																				* See Attachment "A"
3	D	0	0	3	670		P	S	0	2	T	0	1																	
4	D	0	0	8	5		T	S	0	1																				
5																														
6																														
7																														
8																														
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25																														
26																														

EPA I.D. NUMBER (enter from page 1)										FOR OFFICIAL USE ONLY									
<div style="display: flex; justify-content: space-between;"> <span>W</span> <span>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</span> </div>										<div style="display: flex; justify-content: space-between;"> <span>W</span> <span>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</span> </div>									

**IV. DESCRIPTION OF HAZARDOUS WASTES (continued)**

1	A. EPA HAZARD. WASTE NO. (enter code)				B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES											
	1. PROCESS CODES (enter)												2. PROCESS DESCRIPTION (if a code is not entered in D(1))					
	11	12	13	14		15	16	17	18	19	20	21	22	23	24			
1	F	0	0	2	3200	P		S	0	1								
2	F	0	0	3	2500	P		S	0	1								
3	F	0	0	5	4700	P		S	0	1								
4	F	0	0	6	5900	T		S	0	2								
5	F	0	0	7	See F006	T		S	0	2								
6	U	1	5	1	10	P		S	0	1								
7	U	1	5	9	See F005	P		S	0	1								
8	U	1	6	0	1	P		S	0	1								
9																		
10																		
11																		
12																		
13																		
14																		
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16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		
26																		

N/A

EPA I.D. NO. (enter from page 1)												
1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
F	O	H	D	0	0	4	1	7	9	4	5	6

## V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility (see instructions for more detail).

## VI. PHOTOGRAPHS

All existing facilities must include photographs (*aerial or ground-level*) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (*see instructions for more detail*).

## II. FACILITY GEOGRAPHIC LOCATION

LATITUDE (degrees, minutes, & seconds)										LONGITUDE (degrees, minutes, & seconds)									
41		34		040		081		31		018									
11	24	27	21	08	71	72	74	76	78	77	79								

### VIII. FACILITY OWNER


- X** A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

**B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:**

1. NAME OF FACILITY'S LEGAL OWNER															2. PHONE NO. (area code & no.)									
N/A																								
3. STREET OR P.O. BOX															4. CITY OR TOWN									
5. ST.															6. ZIP CODE									


## IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

<b>A. NAME (print or type)</b> F. J. Rechin V.P. & Gen. Mgr., TRW Aircraft Comp. Grp.	<b>B. SIGNATURE</b> 	<b>C. DATE SIGNED</b> 5/9/63
---	--	---------------------------------

## X. OPERATOR CERTIFICATION

certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

<b>A. NAME (print or type)</b> F. J. Rechin V.P. & Gen. Mgr., TRW Aircraft Comp. Grp.	<b>B. SIGNATURE</b> 	<b>C. DATE SIGNED</b> 5/9/12
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**CLOSURE CERTIFICATION REPORT**  
**FOR THE**  
**RCRA CLOSURE OF**  
**DOCK 2-B, BUILDING 45 AND BUILDING 49**  
**AT THE**  
**FORMER TAPCO FACILITY**

**PREPARED FOR**



**TRW Inc.**  
**Cleveland, Ohio**

**JULY 1990**

**PREPARED BY**

**ENGINEERING-SCIENCE**

**DESIGN • RESEARCH • PLANNING**

**19101 VILLAVIEW ROAD, SUITE 301, CLEVELAND, OHIO 44119 • 216/486-9005**  
**OFFICES IN PRINCIPAL CITIES**

ENGINEERING-SCIENCE  
S  
E

**CLOSURE CERTIFICATION REPORT FOR  
RCRA CLOSURE OF  
DOCK 2-B, BUILDING 45 AND BUILDING 49  
AT THE FORMER TRW INC.  
TAPCO FACILITY**

**JULY, 1990**

**Prepared by:**

**ENGINEERING -SCIENCE  
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- E SUMMARY OF WASTES, MANIFESTS AND DESTRUCTION/DISPOSAL CERTIFICATES

## 1.0 INTRODUCTION

The subject facility is an active multi-faceted manufacturing complex located in Euclid, Ohio, formerly owned and operated by TRW Incorporated. While under TRW ownership (then known as the TAPCO facility) three Resource Conservation and Recovery Act (RCRA) hazardous waste management units were operated under interim status. The facility was sold in 1986 at which time TRW ceased manufacturing operations at the site.

The waste management units under consideration are Dock 2-B and Building 45, both of which were used primarily as less than 90-day drum storage waste areas; and Building 49, a waste fuel storage area. A closure plan was prepared for the units and formal approval received on 18 August 1989 from the Ohio EPA (OEPA). The approval letter is attached as part of Appendix A. On 28 August 1989 TRW Environmental Services (TRWES), the contractor for closure activities, mobilized to start work. Following OEPA approval of an extension to the closure schedule for contingent cleaning/removal activities, closure activities were completed on 3 July, 1990.

Closure activities were conducted in accordance with the Ohio EPA approved Closure Plan. Engineering-Science (ES), Cleveland, Ohio, provided supervision of closure activities. This Certification Report has been prepared to document activities and certify completion of the closure.

## 2.0 BUILDING 49 DETAILS

The following description is provided to furnish an understanding of the various components of closure at Building 49.

Building 49 is located in the northeastern portion of the TAPCO facility, inside a fenced compound which isolated torpedo testing activities. Building 49 was built in 1965, originally containing one cell for test firings; a second cell was added later. The storage area for virgin fuel (Otto Fuel II) was located on the eastern side of the building. The other buildings within the compound include a locker room and laundry for torpedo test personnel (Building 48) and storage buildings (Buildings 42, 43, 50 and 51).

Wastewater containing liquid fuel residue and cyanides is generated by the torpedo test firing. Until late 1985, the wastewater was discharged through a 1,000-gallon underground steel separation tank. Liquid residues of unburned fuel were separated in the tank and stored there until hauled off-site for disposal.

Unintentional discharges from the separator tank containing cyanides and liquid residues of unburned torpedo fuel were discovered in 1985 in a swampy area on the south side of the fence. The National Response Center was notified, and TRW authorized studies of the discharge area, to define the extent of the soil affected.

Since the discovery of the discharge, overflows from the separator tank have been diverted to and stored in three holding tanks on the west side of Building 49 until hauled for off-site disposal. A new torpedo test facility has been built elsewhere on the TAPCO site (Building 33), and all torpedo testing activities have been shifted to that location.

A study performed by Engineering-Science defined the limits of residuals within the swamp and a corresponding surface water outlet ("runoff stream"). The limits of detectable PGDN (The major component of Otto Fuel II) and total cyanide above 10 mg/kg (action level for cyanide containing soil removal established by risk

assessment) were delineated. Using these limits and soil sampling results, an area of the swamp was designated for removal. The shape of the area is an irregular Polygon and for the closure has been simply referred to as the "Polygon". Figure 3-1 shows the location of the Polygon and other components of the closure at Building 49.

### Description

At its Euclid plant, Airfoil Forging Textron Inc. manufactures jet engine components from titanium and high-alloy steels. Various metal cleaning, etching, electroplating, phosphating, chromating, and anodizing operations are an integral part of said manufacturing. The Kolene operation processes titanium and stainless steel parts in bulk and baskets at approximately 4,000 to 5,000 pounds per hour, 24 hours per day, seven days per week. (Dump schedules and bath compositions are included in Appendix A.) The majority of the parts come from various forging operations and are coated with a lead oxide lubricant. The same work piece may proceed through the Kolene operation from one to six times before it is completely finished.

The proposed waste treatment system addition consists of batch treatment equipment only. (Existing waste treatment system treats rinse water on a continuous basis. Details of this system have previously been submitted to OEPA.) Concentrated spent solutions are chemically treated as required by sulfuric acid, lime, sodium hydroxide, and sodium metabisulfite in a batch reactor. The metal hydroxide slurry is then pumped to a plate and frame filter press where a filter cake is produced. Filter cake solids are properly disposed of in a landfill and the filtrate is returned to the rinse water treatment system. Specifications are included in Appendix B.

### Summary

TRW Inc. is proposing to install a waste treatment system for Airfoil Forging Textron Inc. in Euclid, Ohio to treat waste generated by metal finishing operations associated with the manufacture of jet engine components. The proposed waste treatment system will use conventional methods of treatment to remove hexavalent chromium from Kolene concentrated solutions. Any other heavy metals present will precipitate as the oxide or hydroxide of the metals. Solids precipitated will be transported to a filter press for dewatering. The filtrate will be returned to an existing rinse water treatment system for further treatment and reuse as process rinse water.

At its Euclid plant, TRW Inc. manufactures jet engine components from titanium and high-alloy steels. Various metal cleaning, etching, electroplating, phosphating, chromating and anodizing operations are an integral part of said manufacturing. The Kolene operation processes titanium and stainless steel parts in bulk and baskets at approximately 4000 to 5000 pounds per hour, 24 hours per day, seven days per week. (Dump schedules and bath compositions are included in Appendix A.) The majority of the parts come from various forging operations and are coated with a lead oxide lubricant. The same work piece may proceed through the Kolene operation from one to six times before it is completely finished.

The proposed waste treatment system consists of continuous treatment equipment only. (Concentrated spent baths will be treated in existing batch treatment equipment.) The rinse water tank overflows (Stream A) are treated on a continuous basis using sulfuric acid (B), sodium hydroxide (H), sodium hydrosulfite (F) and sodium carbonate (G). Effluent from the continuous system discharges to a tube settler clarifier (M). Clarified water is recycled as rinse water to the process lines. Sludge from the clarifier (M) is transported to an existing filter press system (U) for dewatering.

The proposed waste treatment system has a 200 gpm design capacity and consists of a first stage acid addition tank (C), a second stage metals reduction and precipitation tank (E), a flocculation tank (J), a clarifier (M), continuous sludge thickeners (S), final pH adjustment and effluent monitoring tank (P), chemical mixing tanks and auxiliary equipment. Specifications for same are included in Appendix B.

### 3.0 SCOPE OF WORK

#### 3.1 WORK ITEMS

The following work items were included in the closure:

- Preparation of Health and Safety Plans for protection of workers.
- Site improvements as necessary for equipment access.
- Establishment of areas for personnel and equipment cleaning.
- Survey and segregation of soil removal areas.
- Removal of debris pile.
- Dredging of runoff stream.
- Soil removal in Polygon area.
- Separator tank removal.
- Discharge pipe removal.
- Holding tank removal.
- Post-removal soil sampling.
- Backfill & restoration.
- Building 49 demolition.
- Closure of Dock 2-B.
- Closure of Building 45.
- Sampling and disposal of water generated during closure.

#### 3.2 HEALTH AND SAFETY PLANS

Two separate Health and Safety Plans were prepared for the closure activities. The TRW Environmental Services (TRWES) plan was employed by the TRWES crew directly involved in the closure work. The Engineering-Science (ES) plan was utilized by ES personnel for supervision of the closure work. The plans were jointly prepared and approved. TRWES supplied Level B equipment for use by ES

personnel. Air monitoring and medical monitoring were subcontracted through TRWES to Digicolor Corp. of Columbus, Ohio.

### 3.3 SITE IMPROVEMENTS

A temporary gravel roadway was constructed in the swamp along the eastern and southern sides of the soil removal area as required by the Closure Plan. Two office trailers were located along the complex fence north of Building 48. A shower trailer was located along the sidewalk west of Building 42. Figure 3-1 shows the Building 49 site plan including these temporary improvements.

### 3.4 CLEANING AREAS

The primary equipment and personnel cleaning areas were constructed in parallel corridors along the east side of Building 49. Small satellite areas were also used at Dock 2-B and Building 45. The equipment cleaning area construction consisted of a sand sub-base, geotextile fabric, 80 mil HDPE liner, additional geotextile fabric, approximately 6 inches of gravel and finally, plywood sheets along the tire paths to distribute vehicle loads. The entire area was sloped to a low point and fitted with a sump to pump water to either of two holding tanks. Posts supported the liner along the side to a height of approximately 5 feet and lightweight plastic was installed to about 12 feet to contain overspray. This area was used for cleaning of trucks before leaving the site, cleaning of excavation equipment, and cleaning of various tanks and other pieces of equipment removed during the closure.

The construction of the area was completed on 7 September 1989 and was decommissioned on 2 December 1989. Decommissioning consisted of incineration of the gravel and plywood, cleaning of the exposed liner with detergent, and inspection for evidence of leakage. No signs of leakage were observed; therefore followup soil testing was not necessary.

The liquids removed from the various tanks, water removed from excavations, and cleaning water were collected in either of two temporary holding tanks which

were brought onsite for the closure. These "Frac" (oil field terminology) tanks were positioned parallel to Building 43 as shown in Figure 3-1. These tanks were placed on plastic and diked with sandbags to contain any leakage. The intent was to contain small leaks which could be pumped back into the tanks. No such leaks were ever detected. Rainwater was periodically pumped out to the surface water drainage system.

The personnel cleaning area was a roofed enclosure. It included wash tubs for sequential washing of boots and outer garments, storage rack for boots and a container for disposal of outer garments and gloves. The tubs were placed in a metal pan to contain any spills from the tubs. Accumulated water was pumped to the Frac tanks as required.

### 3.5 SURVEY AND SEGREGATION OF SOIL REMOVAL AREAS

Lake Inc., Engineering and Surveying was contracted to re-establish the original sampling grid coordinates in the swamp area. This grid was the basis of all previous investigations and the establishment of the soil removal boundaries (i.e., the "Polygon"). The surveyors set stakes at the intersection of all lines along the perimeter of the Polygon and established elevations of these point for future determination of excavation depth. The survey information is attached as part of Appendix D.

Steel sheet piling was installed along the perimeter of the Polygon to isolate the soil removal area and minimize the unnecessary incineration of excess soil. The piling, which extended to approximately 4 feet above grade, provided a temporary holding area for soil removed from the runoff stream, separator tank and discharge pipe excavations. This greatly reduced the loadout time for the trucks used to transport soil to the incinerator.

During excavation, soil adjacent to the piling was observed closely for evidence that Otto Fuel residuals may extend beyond the piled area. As a further check,

when the piling was removed, the exposed soil wall was examined closely, and no evidence of residuals beyond the polygon was observed.

### 3.6 REMOVAL OF DEBRIS PILE

The Closure Plan identified an area along the steam pipes near previous Sample Station #11 where dredged debris from the runoff stream had been placed in October 1985. No evidence of the debris was visible. A rectangular area approximately 5 feet wide and 10 feet long bounded by Sample Station 11 on the east and the steam lines on the west was staked out and identified as the debris pile. This was the first area excavated (on 12 September 1989), with the soil being temporarily placed within the Polygon. Soil was excavated to a depth of approximately one foot, removing all organic material down to competent clay.

### 3.7 DREDGING OF RUNOFF STREAM

Using the grid system established by the surveyors, previous sample points were located. Except near the Polygon, the previous sample points fell within the defined stream bed. Near the Polygon however, a previous sample point was observed to fall a few feet from the apparent low point of the current streambed. As a precaution the dredging was widened near the Polygon to cover the current streambed and the location of the previous sample point. Prior to dredging, the stream was stationed at 10 foot intervals per the sampling grid shown on Figure 11.2 of the Closure Plan. By actual measurement from the culvert (start of stationing), station point 21 fell within the Polygon and was eliminated from the sampling plan.

The portion of the runoff stream east of the steam lines was excavated on 12 September 1989. The excavated material was placed within the sheeted Polygon area. The runoff stream was excavated to an approximate depth of 2.5 feet.

On 15 September 1989, while excavating within the Polygon, an open joint drain tile was found entering the Polygon from the Southwest. It was later determined that the pipe was sloped to flow into the swamp. Raw and partially decomposed Otto Fuel II had apparently backed up in the pipe for some distance. The alignment

of this pipe was parallel to and east of the newly dredged runoff stream. On 16 September 1989, four sheets of piling were pulled to expose this pipe. Starting at the Polygon, the pipe and surrounding soil were excavated and placed within the Polygon. The pipe was removed to approximately Runoff Stream Station 13, at which point the sediment in the pipe was gray rather than yellow/red. The sediment and soil around the pipe were sampled and found to be clean per Closure Plan levels. This excavation resulted in a widening and deepening of approximately 30 feet of the runoff stream and removal of approximately 10 cubic yards (CY) additional soil for incineration. Additional soil samples were taken along this widened portion of the trench and determined to be clean (See Section 3.12).

On 2 October 1989, the remaining portion of the runoff stream west of the steam lines was excavated. This material was placed directly into the transport truck for incineration. This portion of the stream was excavated to a depth of approximately 1.5 foot, well into competent clay.

The Closure Plan called for cleaning out the culvert at the downstream end of the runoff stream. It was determined that this would be difficult to accomplish in place. Therefore, the culvert was removed, emptied of sediment and ultimately cut up and incinerated.

The Closure Plan also called for removal of sediments from Manhole #3, approximately 300 feet from where the runoff stream enters the storm drainage system. This manhole was inspected and no sediment was present; therefore no removal was performed. Manholes #1 and #2 were also checked to confirm that there was no sediment in the remainder of the system.

### **3.8 SOIL REMOVAL IN POLYGON AREA**

Dredging of the Polygon commenced on 13 September 1989 and was completed on 29 September 1989. During this time, the Polygon area was used for staging of soil from the separator tank and discharge pipe excavations.

Significant amounts of Otto Fuel residuals were found near the center of the Polygon around the drain pipe previously discussed in Section 3.7. The drain pipe had apparently filled with Otto Fuel II. Over time much of this fuel decomposed to a yellow sludge and some of the soil around the pipe was stained with this material. When sections of the pipe were removed, Raw Otto Fuel II, bright red in color, flowed from the pipe. Care was taken to remove all visual traces of the red fuel and yellow stained soil.

Excavation depth within the Polygon ranged from 3 to 5 feet with an average of about 4 feet. Soil was removed to this depth to remove all visual traces of Otto Fuel. The excavated surface was well into competent clay and shale.

All samples taken within the polygon were clean per the closure limits with the exception of sample P-15. Analytical results indicated PGDN at 100 mg/kg, above the clean limit of non-detect (at a detection limit of 20 mg/kg). No visual evidence was present, however an additional one foot of shale was removed at this location on 29 September 1989 and the area resampled. This followup sample was non-detect for PGDN.

### 3.9 SEPARATOR TANK REMOVAL

Prior to excavation for removal of the separator tank, the hatch was opened and the tank found to be full of liquid. This liquid was sampled and pumped to the west Frac tank. Subsequent analysis showed the PGDN concentration of this liquid to be 950 mg/L (see Appendix B).

The soil above the tank was observed to be clean and was set aside to be used later for backfill. The soil adjacent to the tank was saturated, black in color, and exhibited a strong solvent odor. This black sandy soil was sampled and tested for priority pollutants, PGDN, and cyanide. The cyanide and PGDN were non-detect; however, the PGDN detection limit for this analysis was above the normal detection limit of 20 mg/kg due to apparent interference by unidentified hydrocarbons. No priority pollutant volatiles were detected in the analysis. Discussions with persons familiar with the torpedo test operations indicated that petroleum-based cleaning

solvents were commonly used as part of the operations. The solvent that was predominantly used, Agitene, contains no benzene or chlorinated solvents.

The tank's anchor cables were cut and the tank was pulled from the excavation. The saturated material immediately filled the void. Due to the unknown concentration of PGDN in the saturated material mentioned above, it was removed from the excavation and incinerated. This saturated material was apparently the granular backfill that was used during tank installation. This material was found to be contained by the clay walls of the original tank excavation. As a precaution, some of the adjacent clay which appeared darkened was also removed and incinerated. Additional clay at the periphery was placed in a roll-off box, sampled and determined to be clean before being used as backfill.

The tank was found to be anchored to a large slab which covered the entire bottom of the original excavation. Instead of removing the slab to sample the sub-grade, two holes were jack-hammered through the slab for sampling. Samples were also taken adjacent to the slab and in the clay side walls of the excavation. These samples were all clean per Closure Plan limits.

To gain access to the interior of the tank, it was cut into two sections. The interior of the tank contained red liquid (raw Otto Fuel II), yellow liquid (decomposed fuel) and black sludge (combustion products). This material was solidified by mixing with soil from the Polygon and containerized for incineration. The interior of the tank was scrubbed with detergent and triple rinsed with pressurized water. At this point the tank would have been considered clean per the Closure Plan based on visual inspection for reddish color. From experience during the closure, it was found that the torpedo fuel actually leaves a yellow stain when it contacts a porous surface. Although no red or yellow stains remained, the cleanliness of the tank was still suspect due to its rusty condition. To eliminate any doubt, the tank was cut up and incinerated.

### 3.10 DISCHARGE PIPE REMOVAL

The removal of the discharge pipe falls into three categories: 1) influent pipes from the test cells to the separator; 2) original discharge pipe from the separator to the swamp, and 3) the redirected discharge pipe to the concrete holding tanks. All of the pipe was bell and spigot vitrified clay pipe with O-ring gasketed joints. The sand bedding around the pipe was blackened in places, indicating possible joint leakage. Another possibility is that leakage from the separator tank had infiltrated the granular bedding material. In either event, it was determined to remove and incinerate all discolored bedding material.

The Closure Plan called for removal and cleaning of the discharge pipe. The "clean" criteria was (as with the separator tank) to wash until "the intensely reddish torpedo fuel color is no longer visible". Cleaning was deemed impractical and the decision was made to incinerate the pipe along with the soil. The removed pipe and surrounding soil were staged either in the Polygon or separator tank area until trucks were available for transport.

The soil above the pipe was inspected as it was excavated and stockpiled for use as fill. No evidence of residuals was found from the surface down to the top of the pipe. At this point, the pipe and surrounding soil were segregated for incineration. The pipe was excavated from 18 September 1989 through 20 September 1989 with the exception of the north-south runs of pipe from the test cells which were removed on 17 October 1989. The original discharge pipe to the swamp was removed with a backhoe since it was found to be encased in concrete. The remaining pipe was exposed with the backhoe and then removed by hand, followed by hand removal of darkened bedding material. Shelby tube soil samples (see Section 3.12) taken along the cleaned trench on 27 September and 29 September 1989 were all clean per Closure Plan limits. Upon receipt of the analytical results from these samples and the samples from the separator tank area, the area was backfilled (on 13 October 1989) thus allowing access to the north-south runs of pipe from the test cells.

The north-south test cell pipes were removed on 17 October 1989 by exposing with the backhoe followed by hand removal. Since bulk soil removal was completed prior to this, the pipe and affected soil were placed in hazardous waste shipping

containers. The joints of these pipes showed evidence of leakage, and raw and partially decomposed Otto Fuel II were found in and around the pipes. A branch connection to the east test cell drain picked up the drain from the raw Otto Fuel II storage area. This storage area pipe appeared to be a major contributor to the residuals contained in the east test cell drain pipe. The Closure Plan did not specifically call for removal of this pipe. Due to the presence of Otto Fuel residuals, it was removed on 24 October 1989 using the same methods described for the test cell pipe removal. Shelby tube samples of the remaining soil beneath the test cell drains and the raw fuel drain pipe were found to be clean per Closure Plan limits.

### 3.11 HOLDING TANK REMOVAL

Excavation for removal of the holding tanks was initiated on 21 September 1989 and the area backfilled on 3 November 1989. Prior to excavation, the contents of the tanks were sampled and pumped to the west Frac tank. Analytical results showed that the contents contained detectable amounts of both PGDN and cyanide. Groundwater intrusion into the excavation was also periodically pumped to the west Frac tank.

The excavated soil was stockpiled west of the excavation for use as backfill. While initially excavating along the east side of the tank, a heavy flow of water entered the excavation. This later proved to be water draining from the gravel fill around the tanks. Once the initial water was removed, groundwater infiltration from the surrounding clay soil was minimal. Since the saturated material was potentially affected by tank leakage, the stockpiled material was tested for PGDN and cyanide and found to be clean prior to use as backfill.

The Closure Plan called for removing the tanks, washing with detergent and rinsing until the staining was no longer visible. This approach was found to be impractical due to size limitations and the fact that no red color was initially visible; however, the presence of residuals was still suspected. Removal/cleaning was also complicated by the fact that the tanks were two piece (top and bottom), and the bottom halves were encased in concrete. The following outlines the procedures

used for removal and cleaning of the tanks, and sampling performed to assure a clean closure:

- 1) Top halves of the tanks were removed, taken to the equipment cleaning area, washed with detergent, pressure rinsed, and stored on plastic north of the cleaning area.
- 2) Remaining liquids in tank bottoms were pumped to the west Frac tank. Remaining sludge was solidified with portland cement, and containerized for incineration.
- 3) Tank bottoms were washed and pressure rinsed in place. Despite vigorous scrubbing and rinsing, a black coating remained on the tank walls, particularly in the south and center tanks. Also the tongue and groove joints between the tank halves showed some yellow staining (characteristic of Otto Fuel II). This was apparent mostly in the asphaltic material used to seal the joint.
- 4) Composite concrete samples of the black coating and stained area at the tank joints were analyzed for PGDN and cyanide. These worst-case samples were taken to assess whether the most suspect portions of the tanks were below clean levels set (for soil) in the Closure Plan. Analytical results indicated concentrations above acceptable levels; therefore further action was taken.
- 5) Stained concrete along the joints was removed and placed in bags for incineration. The tank tops (on plastic) and the tank bottoms (in place) were scrubbed again with detergent, rinsed, and a final rinse collected for analysis in accordance with the Closure Plan. The samples were analyzed for PGDN which was non-detect in the rinseate.
- 6) On the basis of the above testing, the tanks were considered clean. The tank bottoms were removed (jack-hammered) from their concrete encasement and placed in a dumpster. Similarly, the tank tops were

broken up and placed in a dumpster. A composite sample was taken from each of the dumpsters and tested for the RCRA characteristics of toxicity (pesticides, herbicides and metals), ignitability, corrosivity, and reactivity prior to disposal. All parameters were below regulatory limits; therefore the concrete tanks were released for disposal as a non-hazardous solid waste.

- 7) A hole was jack-hammered through the remaining concrete encasement of each tank to allow for sampling of the underlying soil. Approximately six inches of clean gravel was typically found beneath the concrete encasement. This gravel was removed so that a Shelby tube could be pushed into the underlying soil. Water (observed to be very clean) was pumped out of the gravel layer to the west Frac tank in order to facilitate sampling. The sample zone was well into the shale, which made it very difficult to push the Shelby tubes. An average recovery of approximately five inches provided sufficient sample. The Closure Plan called for four samples in the holding tank area, so an additional sample was taken adjacent to the concrete encasement along the west side of the north tank (at a low point where residuals may have potentially collected). These samples were analyzed and found to be clean per Closure Plan limits.
- 8) Two additional samples were taken adjacent to the concrete encasement around the south tank in areas of suspected leakage of the tank joint and inlet pipe connection. The soil in these areas was somewhat discolored but proved to be clean per Closure Plan limits.

Upon receipt of the analytical results confirming clean soil, the tank area was backfilled with soil from the excavated stockpile and the soil mound that was designated for use as fill. In order to facilitate backfill operations, the above-ground steam and compressed air pipes were removed.

### 3.12 POST-REMOVAL SOIL SAMPLING

Soil sampling in the Building 49 area generally followed the provisions of Section 11 of the Closure Plan. Unless otherwise noted, soil samples were taken by pushing three inch diameter Shelby tubes with the backhoe bucket. The entire recovered sample was used for analysis. The Shelby tubes were cleaned with lab grade detergent and rinsed with distilled water before use. After sampling, the tubes were sealed with aluminum foil and delivered to the lab on the same day.

All laboratory analysis for the closure was performed by Wadsworth/ALERT Laboratories, in Cleveland, Ohio and Canton, Ohio. Quality Assurance/Quality Control (QA/QC) procedures per Section 11 of the Closure Plan were followed. A log of all samples is attached as Appendix B, and all analytical reports are on file at ES and TRW. Figures 3-2 and 3-3 show the location of all soil samples taken in Building 49 area. Sample number prefixes were assigned per the following table:

P = Polygon  
D = Debris Pile  
R = Runoff Stream  
DP = Discharge Pipe  
IP = Inlet Pipe (from test cells to the separator tank)  
ST = Separator Tank  
HT = Holding Tank  
SP = Stockpile  
E = Extra (where additional samples were deemed necessary)

Sequential or predetermined random grid numbers were attached to the above prefixes. The location and depths of all samples were documented for future reference. Analysis of all soil samples was for PGDN and total cyanide with clean closure levels per the Closure Plan being non-detect for PGDN and 10 mg/kg for cyanide. During the original studies, a detection limit of 25 mg/kg was set for the PGDN analysis. Subsequent to this, Wadsworth/ALERT was able to detect to a lower limit of 20 mg/kg. The lower limit was used during the Closure as the clean limit. With the exception of sample P-15, all soil samples were non-detect for PGDN. Additional soil was removed at grid location P-15 (see Section 3.8) to address the residual PGDN that was detected. After soil removal, sample E-6 was taken and found to be non-detect indicating that the residual PGDN had been removed. No soil samples were found to be above the clean limit of 10 mg/kg for

cyanide. Reported values for cyanide ranged from non-detect to a maximum of 1.3 mg/kg.

In summary, the Soil Sampling Program confirmed that no residuals contamination above the risk-based action levels established in the Closure Plan remain in the soil in the Building 49 area.

### 3.13 BACKFILL AND RESTORATION

After analytical results confirmed that the remaining soil was clean, the areas were backfilled with soil from the former earth mound located between Building 49 and the swamp. The Closure Plan called for the use of this soil which had been previously tested for use as fill.

The earth mound did not provide enough material to backfill all the areas. The balance of the fill material was purchased from Kurtz Brothers Inc., and came from the Sandy Hill Pit in Valley View, Ohio. A sample of this material (E-22) was analyzed per the U.S. EPA Superfund Target Compound List parameters for volatiles, semi-volatiles, PCBs, pesticides, metals and cyanide. All parameters tested for were within acceptable limits. A total of 144 cubic yards of this material was delivered to the site and was used to fill any remaining low areas. The grading was completed and the replacement fence erected on 21 December 1989.

Due to the extremely cold weather, the final grading was somewhat crude, and seeding of the area was impossible. In June 1990 Emerson Construction was contracted to regrade and seed the area. No additional soil was brought onsite for this operation. At this time, the runoff stream culvert was also replaced.

### 3.14 BUILDING 49 DEMOLITION

In order to assure that no residuals remained within or under Building 49, TRW decided to remove the Building completely. The original Building 49 Study (an attachment to the Closure Plan) did suggest that areas of potential spillage of Otto Fuel II within/adjacent to Building 49 be addressed. The raw fuel storage area and

locations within the east test cell exhibited the yellow staining indicative of spilled fuel. The general guidelines for cleaning and action levels followed during the closure were applied to the demolition.

The following outlines the procedures used for removal and cleaning of the building, and sampling performed to assure a clean closure:

- 1) The roof, pipe insulation, and transite pipe were removed and disposed of as asbestos containing materials, based on previous sampling results.
- 2) Stained concrete in the raw fuel storage area, around the test cell drains, and in other isolated areas within the east test cell was removed and incinerated.
- 3) Piping, equipment, and other loose material were removed from the building and placed in the equipment cleaning area. Items suspected of containing cyanide, particularly the test cell exhaust fans and duct work, were scrubbed with chlorine bleach (to oxidize cyanide) and rinsed. Piping and other items which had been in contact with the Otto Fuel II were scrubbed with detergent and rinsed. Significantly stained items and stainless steel tubing which still contained Otto Fuel were cut up and incinerated. The cleaned items were placed in a bermed plastic-lined area and rinsed. The rinseate was collected and sampled ( Sample E-29) for PGDN and cyanide. The results were non-detect for PGDN and 0.02 mg/L for cyanide. The guidelines in Section 6.12 of the Closure Plan for a clean rinseate were applied to determine acceptability. Since Maximum Contaminant Levels (MCLs) are not published for either substance, the acceptance criteria was 1 mg/L for cyanide, and the detection limit for PGDN. Based upon these criteria, the rinsed equipment was determined to be clean and disposed of as scrap metal.
- 4) The interior of each test cell was scrubbed with detergent and rinsed. A final rinse from each test cell was sampled (Samples E-26 and E-27) and analyzed as described above. Results for both samples were non-detect

for cyanide and PGDN. As an extra precaution, a composited sample of remaining concrete (E-28) was tested for the hazardous waste characteristics of toxicity, ignitability, corrosivity, and reactivity prior to demolition. Results showed that the concrete did not exhibit any hazardous characteristics.

- 5) Demolition proceeded in an orderly manner, starting with the superstructure. All stages of demolition were observed carefully for signs of residuals. Some additional stained concrete from the raw fuel storage area was segregated and incinerated. The floors in each test cell were cut free along the perimeter and removed in one piece. This allowed for careful observation of the undisturbed subgrade for signs of residuals. No evidence of residuals was found. Finally, the building foundations were removed.
- 6) Since there were no signs of subsurface residuals, extensive sampling was not performed. For verification purposes, one composite sample of soil was taken from beneath the test cell areas. Analysis for cyanide and PGDN showed cyanide at 0.5 mg/kg (less than the risk-based action level of 10 mg/kg) and PGDN non-detect. The area was backfilled with material excavated for footing removal and supplemented with the tested fill material described in Section 3.13.

The demolition and subsequent inspection of Building 49 provides additional assurance that no residuals remain in the area.

### 3.15 CLOSURE OF DOCK 2-B

The initial activity at Dock 2-B was the placement of plastic sheeting over the perimeter wire cage fence to contain dust and overspray. The wood block flooring was then removed using a pry bar. During the initial wood block removal operation, monitoring for organic vapors was performed. The maximum vapor reading on the OVA was 3 ppm. The removed wood blocks were placed in hazardous waste shipping cartons and transported to Building 43 pending shipment for incineration

(per the Closure Plan). Wood blocks remaining along the perimeter were sampled (Samples WB-1 through WB-8) and analyzed for volatile organics. Analytical results were non-detect for all compounds in all samples. This sampling was required by the Closure Plan to determine if any materials previously stored within the storage area had migrated beyond the boundary.

Once the blocks were removed, the next step was removal of the tar-like material that had been used as an adhesive for the blocks. Various hand and power methods were used to remove this material. This material was swept up, placed in sacks and ultimately incinerated with the wood blocks.

Pressure washing of the floor was the next activity. The following gives the general procedure established for pressure washing and associated sampling of rinseates:

- 1) Complete cleaning of the collection vacuum with lab grade detergent, and rinse with distilled water.
- 2) Collection of a field rinse blank by running distilled water through the vacuum system.
- 3) Pressure washing the floor using tap water and a pressure washer delivering approximately 2,500 psi at the washer.
- 4) Collection of standing water with the vacuum system.
- 5) Sample the resulting rinseate for analysis, with an additional blind duplicate taken of the final rinse.
- 6) Placement of rinseate in drums pending disposal.
- 7) Circulation of tap water through the vacuum system to dislodge any particulate which may affect the subsequent rinse results.

- 8) Repetition of the above steps as required.

The procedure was performed four times; however, only the last three rinses were sampled. The initial rinse was black from the tar dust and was considered a pre-rinse, and not sampled or counted as one of the three sequential rinses. Even the third (final) rinse contained a considerable amount of black particulate.

The rinses were sampled and analyzed for:

- 1) 13 Priority Pollutant Metals.
- 2) 43 volatiles per methods 8010/8020.
- 3) 1,4-Dioxane and methyl ethyl ketone (MEK) per Method 8015.
- 4) Total cyanide.

The analytical results are summarized in Appendix B. A general decrease in contaminant levels was observed in the successive rinses. The third rinse was clean per closure plan limits (generally MCLs) for all volatiles and cyanide. Four metals; cadmium, chromium, mercury and lead, remained in the third rinse above their respective MCLs.

The decrease in levels for successive rinses seemed to indicate that additional cleaning could possibly remove remaining residuals. The continuing particulate in the rinses, and concern that the tap water source may have contained elevated levels of lead also reinforced a decision to do further cleaning in lieu of concrete removal. Visual inspection did not indicate that a spot source had contributed to the elevated levels of metals in the rinseate.

Further cleaning was performed with the following procedural modifications made:

- 1) Wet down and scrub the floor with a wire bristle power scrubber and inhibited phosphoric acid detergent.
- 2) Pressure rinse and wet vacuum until the detergent residue is removed.
- 3) Final rinse and collect a sample of the final rinseate utilizing a separate pre-cleaned vacuum. The concern was that the vacuum used for the initial cleanings could not be cleaned sufficiently to remove particulate trapped in the corrugated hose.
- 4) Collect a tap water blank of the source water to verify it to be clean.
- 5) Collect a field rinse blank of distilled water run through the new vacuum to verify the vacuum to be clean.
- 6) Analyze all samples including a duplicate of the final rinse for total cadmium, chromium, mercury and lead.

The modified procedure was performed and all parameters except lead were below the MCLs. The concentration of lead was still approximately five times the MCL but had been reduced by half from the previous rinse. The tap water blank was non-detect for lead.

Concern over remaining detergent foam in the final rinse prompted a repeat of the previous procedure. No additional detergent was used; however, scrubbing and rinsing were performed until the foaming of the rinseate was minimal. Analysis was performed for all four metals. Cadmium, chromium, and mercury were below detection and lead was approximately one half the MCL, an acceptable level.

The waste management unit at Dock 2-B was considered clean on the basis of this final rinse. In June of 1990, a replacement concrete floor was poured as called for in the Closure Plan.

### 3.16 CLOSURE OF BUILDING 45

The closure of the two separate waste management units at Building 45, Building 45-A and Building 45-B generally followed the same procedures as Dock 2-B. Similar to Dock 2-B, the results of the initial three rinses were non-detect for volatiles, and above MCLs for cadmium, chromium, and lead. These results are summarized in Appendix B. The two followup activities of detergent scrubbing and further rinsing to remove detergent deposits were conducted as they were for Dock 2-B. At that point, the lead concentration in the rinseate at Building 45-A was still above the MCL. Results for Building 45-B were all at or above the respective MCLs for chromium, cadmium and lead.

The presence of lead in the tap water blank at 80 percent of the MCL prompted a decision to re-rinse utilizing distilled water as the water source. Also, the previous scrubbing efforts were concentrated on a stain in Building 45-B suspected to be from the leakage of a drum containing electroplating sludges. Thorough scrubbing of the stain had reduced the chromium concentration at the surface to a point that a considerable reduction in the rinseate was noted (from twenty times the MCL down to the MCL). Although this met the criteria for a clean closure, based upon the surface condition, subsurface residuals were expected.

Samsel Services was contracted to remove the stained concrete and perform an additional series of pressure rinses utilizing distilled water. The results of this effort are shown in Appendix B. The rinseate analysis still showed an elevated level of lead at Building 45-A and elevated levels for both chromium and lead at Building 45-B. The elevated level of chromium is attributed to the fact that a fresh surface had been exposed when the stained concrete was removed. Further investigation showed that only a dark brown stain at the surface had been removed, but deeper yellow staining remained. Later analysis of the removed concrete (Sample E-30) for extractable metals (EP Toxicity test) showed high concentrations of residual chromium (130 mg/L in the extract).

It was obvious at this point that further rinsing would not reduce the lead and chromium concentrations in the rinseate. Chromium residuals in the concrete would be addressed by removing the obviously stained concrete in the area of the

drum spill. However, no point source was visually apparent for the lead contamination. Appendix B lists the lead levels detected in the successive rinses. The lead concentration of 100 mg/L in the first rinse from Building 45-B indicates that possibly a layer of lead-containing dust was removed initially. Successive rinses showed considerable reductions; however, each rinse still seemed to collect enough lead from the surface to elevate the rinse level above the MCL. It is assumed from these observations that lead from a dispersed source has penetrated the concrete to a very thin depth.

To assess whether point sources of the residual lead/chromium were present, random concrete samples were taken at grid locations shown on Figure 6.9 of the Closure Plan (Samples A4, A5, A19, B4, B6, B19, B20 and B26). These samples were hand chipped to a maximum depth of one-eighth inch in order to not "dilute" the surface condition. The samples were analyzed for extractable cadmium, chromium, and lead. All samples showed a trace amount of cadmium (well below EP Toxicity regulatory limits) and were non-detect for chromium and lead. The random sampling had therefore not identified any apparent point sources, upon which concrete removal was to be based. The sample analysis also indicated that even a very thin layer of the surface concrete was not EP Toxic. However, the decision was made to remove a thin layer of concrete throughout the Building 45 RCRA storage area to assure a clean closure. On 23 February 1990, TRW filed for an extension of the Closure Plan to facilitate this work. Copies of the request and subsequent EPA approval are attached as part of Appendix A.

A conservative approach of partial depth concrete removal was taken to address the known chromium residual area and the assumed dispersed lead source on the concrete surface. Further sampling (Samples E-31 through E-39) was performed to identify the extent of the chromium residuals. Concrete removal to a depth of 2 inches was proposed for a 25 square foot area in the area of obvious staining. An adjacent area also about 25 square feet in size would require removal to one-half inch. This would, at a minimum, remove all concrete containing chromium above EP Toxicity levels. Followup testing of both areas would confirm a clean substrate. At the same time, approximately one-eighth inch of concrete would be removed from the entire floor surface of both RCRA units (Building 45-A and 45-B) to address the assumed thin lead layer.

Sunpro Services was contracted to perform the proposed concrete removal. Concrete was removed and samples E-36 and E-37 composited from the newly exposed surface. Both samples were well below EP-Toxicity levels. The removed concrete was profiled per the "worst case" analytical results from sample E-30 (original surface concrete removed by Samsel Services) and disposed of as a hazardous waste in a RCRA landfill.

The waste management units at Building 45 are now considered clean on the basis of removal of all suspect concrete exhibiting the characteristics of EP Toxicity. In July of 1990, the concrete surface was restored as called for in the Closure Plan.

### 3.17 SAMPLING AND DISPOSAL OF WATER

Cleaning water and potentially contaminated water generated during the closure was collected in the two 20,000-gallon Frac tanks or in drums, pending analysis and disposal. The east tank (Frac tank #2) was generally intended to collect more dilute sources such as shower water, equipment cleaning water, and collected groundwater. The west tank (Frac tank #1) received more potentially concentrated sources such as the initial liquids pumped from the separator and holding tanks. On this basis, it was expected that the east tank would test out "clean" and could be discharged to the sanitary sewer system whereas the west tank would require incineration.

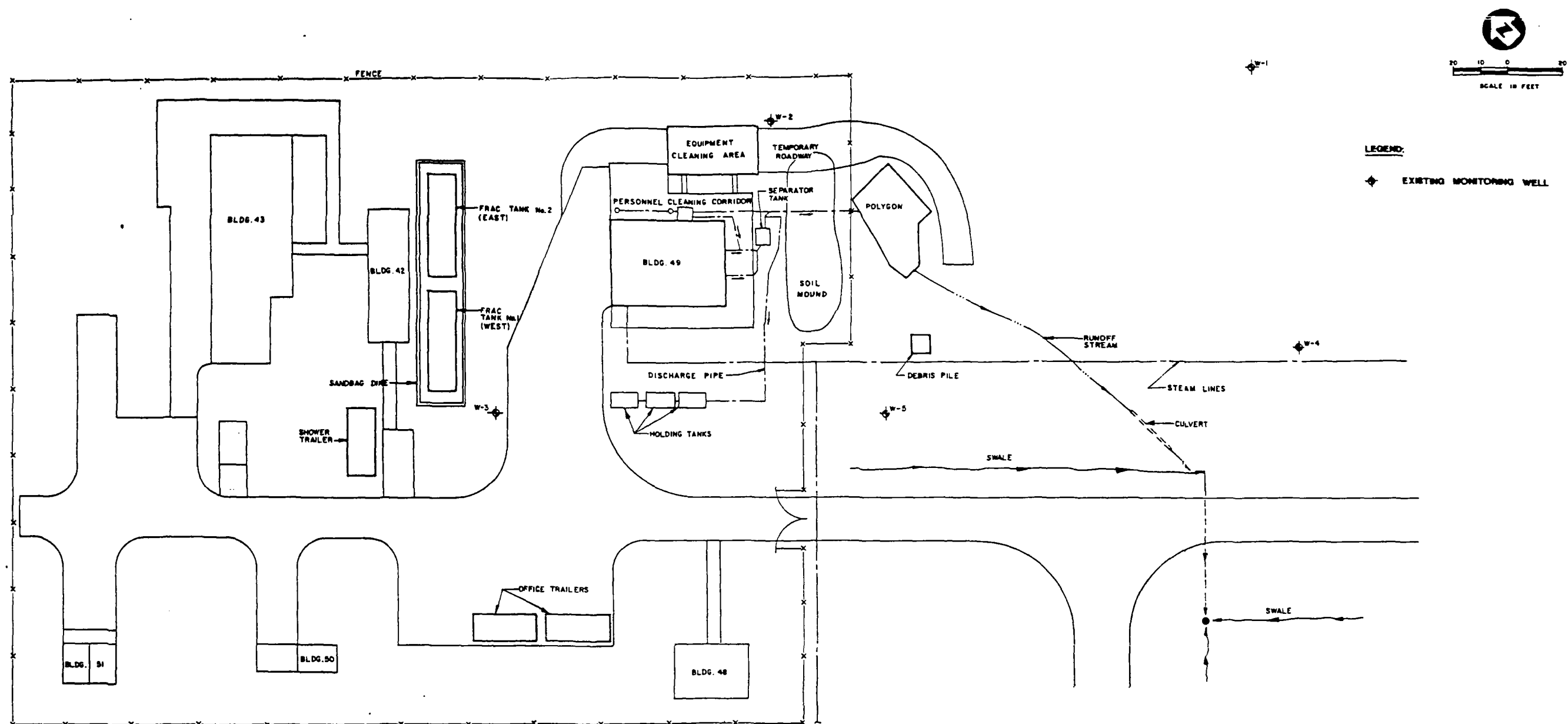
A meeting was held with the City of Euclid Wastewater Treatment personnel to discuss pretreatment discharge limits. Copies of correspondence between TRWES and the City of Euclid are attached as Appendix C. This correspondence summarizes the pretreatment requirements, test results, and ultimate approvals for discharge. As expected, Frac tank #2 was found to be acceptable and was discharged to the sanitary sewer system as approved by the City of Euclid.

Frac tank #1 was unacceptable for discharge to the sewer due to the high level of PGDN (110 mg/L). The contents of this tank were pumped through activated carbon canisters and collected in the east Frac tank. Approximately 3,500 gallons were left untreated and ultimately incinerated, as were the spent carbon canisters.

The treated water, (approximately 15,000 gallons) was tested, found to meet the City of Euclid's concentration limits, and subsequently discharged to the sanitary sewer system.

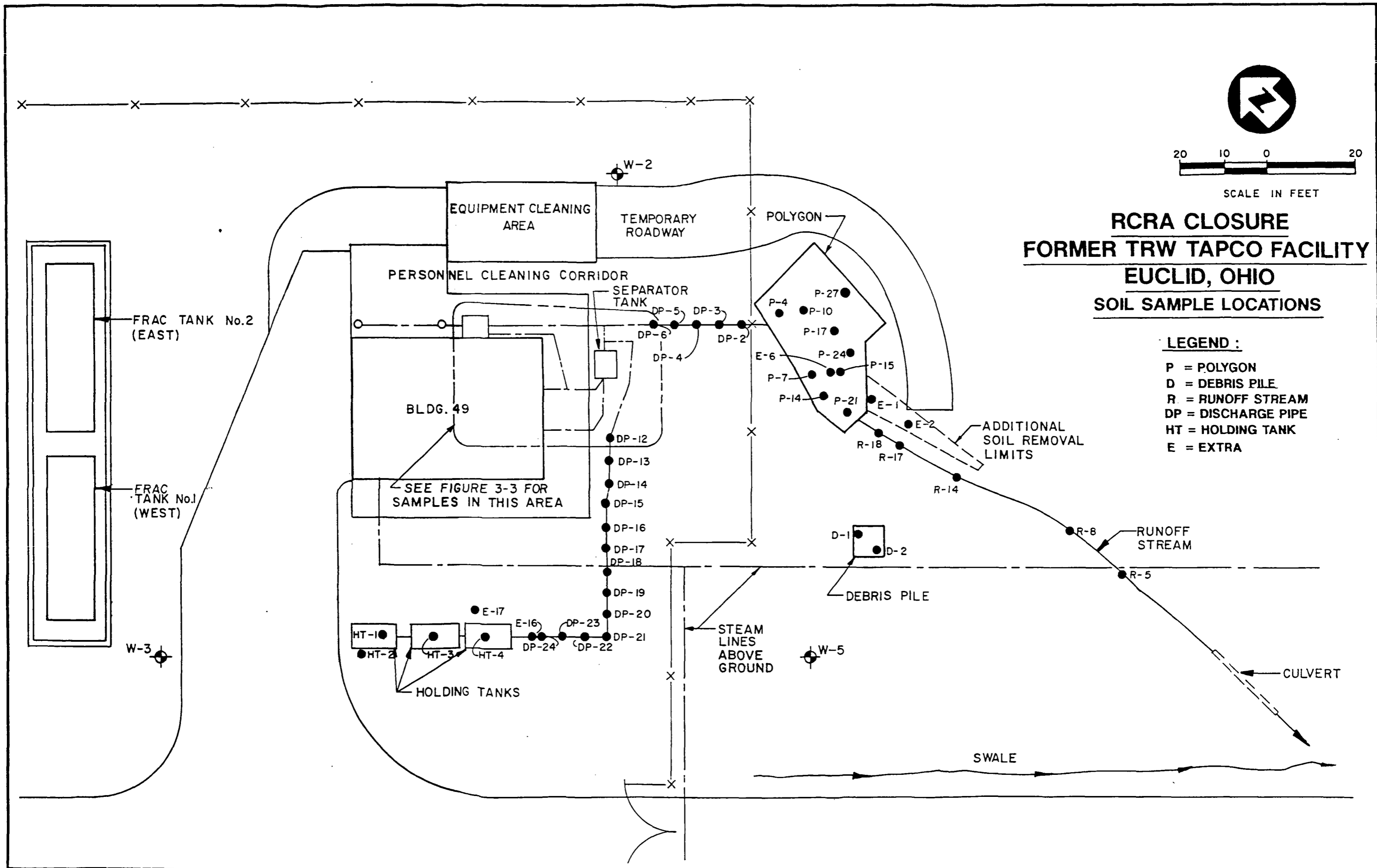
Drums of water generated during the pressure washing of Dock 2-B, Building 45, and the concrete holding tanks were added to the 3,500 gallons in the west Frac tank. This resulted in approximately 5,000 gallons of water which was pumped out for incineration on 6 December 1989.

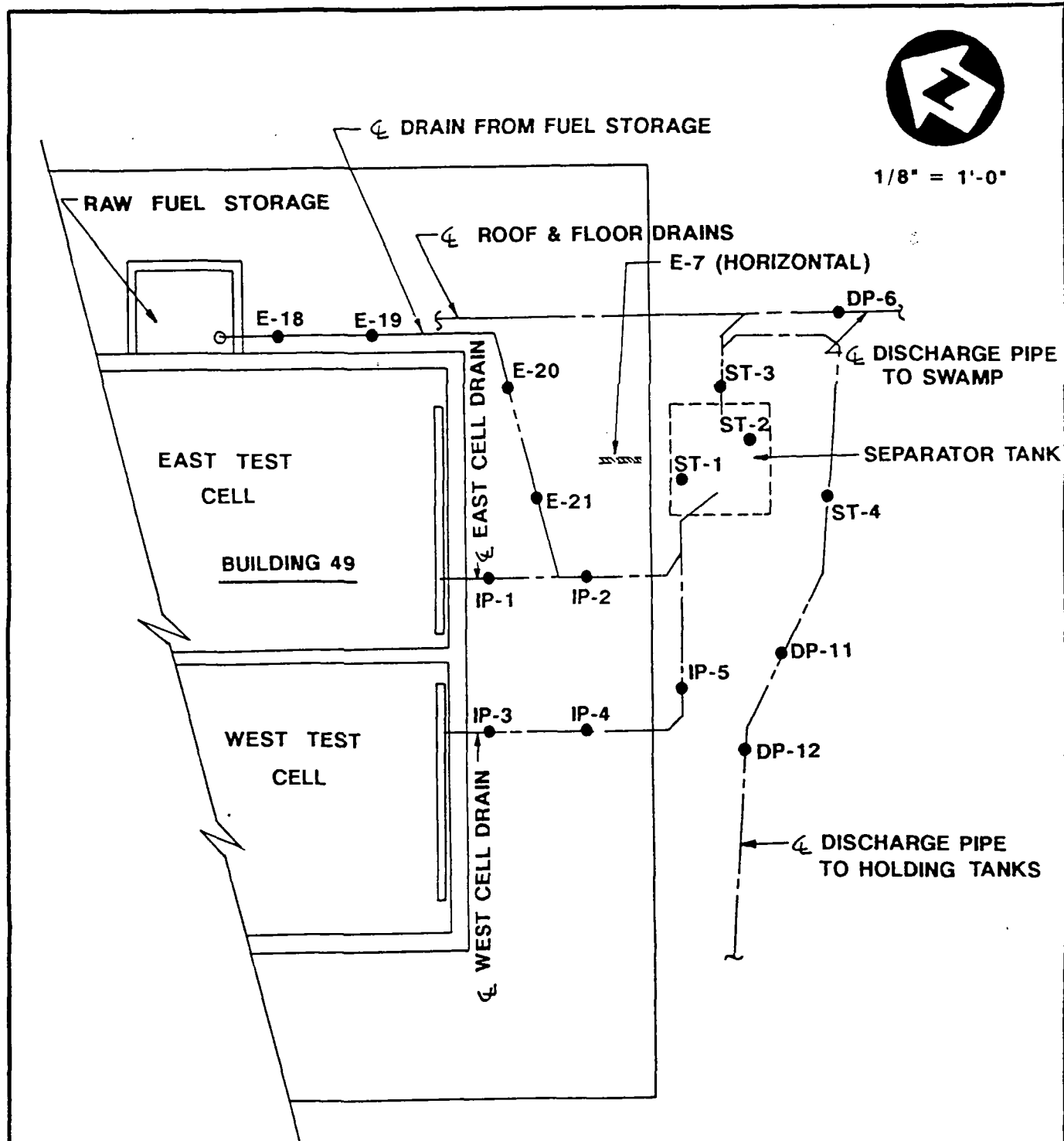
Ten drums of rinse water were generated as a result of followup rinsings at Dock 2-B and Building 45 after 6 December 1989. This rinseate was transported and treated by Clean Harbors of Cleveland. Although this water did not exhibit hazardous waste characteristics, it was handled as such in accordance with the Closure Plan.



**RCRA CLOSURE**  
**FORMER TRW TAPCO FACILITY**  
**EUCLID, OHIO**  
**BUILDING 49 AREA LAYOUT**

FIGURE 3-2



**LEGEND:**

ST= SEPARATOR TANK

IP= INLET PIPE

DP= DISCHARGE PIPE

E= EXTRA

**RCRA CLOSURE**  
**FORMER TRW TAPCO FACILITY**  
**EUCLID, OHIO**  
**SEPARATOR TANK AND INLET PIPE**  
**SOIL SAMPLE LOCATIONS**

#### 4.0 CLOSURE SUMMARY

OWNER: TRW Inc.

CONTRACTOR: TRW - Environmental Services

SUBCON-TRACTORS: American Abatement and Asbestos Removal Corp. - Building 49 Asbestos Removal

Al Fierri Contractors - Building 49 demolition

Brookpark Fence Company - Fence Replacement

Lake Inc., Engineering and Surveying - Site Surveying

ADDITIONAL CONTRACTORS: Samsel Services Company Building 45 - cleaning

Sunpro Services, Inc. Building 45 - concrete removal

Emerson Construction - Final grading and concrete replacement.

DISPOSAL: Incineration of soil and other contaminated solids - LWD, Inc. Calvert City, Kentucky; with the resulting ash deposited at either of two Chemical Waste Management landfills at Emelle, Alabama or Fort Wayne, Indiana

Disposal of asbestos containing materials - S & S Landfill, Clarksburg, West Virginia

Incineration of contaminated wastewater - LWD, Inc. Calvert City, Kentucky

Treatment of Dock 2-B and Building 45 followup rinseates - Clean Harbors, Cleveland, Ohio

Disposal of Building 45 concrete - ESOL, Oregon, Ohio

A complete summary of these wastes is included as Appendix E. Manifests and certificates of destruction are included for the hazardous wastes. A complete summary of all non-hazardous materials removed from the site during the closure is also included.

## 5.0 RECORDS

### 5.1 PHOTOGRAPHS

Photographs were taken throughout the project to document the closure. Copies of these photographs are contained in ES and TRW files.

### 5.2 SURVEY

Throughout the project, sample locations and depths, pre-removal locations of tanks and piping, and location of other pertinent features were documented by the Engineer in the form of field notes and sketches. Much of this information was referenced to Building 49. Other information was referenced to the "grid" established during the initial investigation of the site. This grid was established relative to the steam lines running to Building 38. These steam lines are scheduled for removal as part of the Tungsten Road Extension Project. Removal of Building 49 and the steam lines would make it difficult to relocate any documented item in the future. To address this, Lake Inc., Engineering and Surveying was hired to tie the building and sampling grid to a permanent feature. From this survey (Appendix D), Building 49 and the sampling grid can be relocated from East Drive. The elevation of the Building 49 floor slab (elevation 100 for all closure activities) has been converted to U.S.G.S. Elevation 653.65 feet.

## 6.0 STATUS OF FACILITY

The three waste management units at the former TRW Tapco Facility have been clean closed in accordance with the Closure Plan, and as modified per the discussions in this report. The work plan action items to complete the closure commenced on 28 August 1989 and terminated on 3 July 1990.

As of 3 July 1990, seven drums containing concrete removed at Building 45 were still onsite. This waste has been profiled and accepted for disposal at ESOI's facility at Oregon, Ohio. Shipment is expected during the week of 9 July 1990.

## 7.0 CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

ENGINEERING-SCIENCE

A handwritten signature in cursive script, reading "Glen A. Dieterle", written over a horizontal line.

Glen A. Dieterle  
Registered Professional Engineer  
Ohio E-44284

TRW INC.

A handwritten signature in cursive script, reading "William A. George", written over a horizontal line.

**APPENDIX A**  
**EPA CORRESPONDENCE**



State of Ohio Environmental Protection Agency

P.O. Box 1049, 1800 WaterMark Dr.  
Columbus, Ohio 43266-0149

Richard F. Celeste  
Governor

August 18, 1989

RE: Closure of TRW Facility  
at 23555 Euclid Avenue.

Mr. Andrew L. Resetar  
TRW, Inc.  
1900 Richmond Road  
Cleveland, Ohio 44124

Dear Mr. Resetar:

On December 12, 1988, Ohio EPA approved the closure plan for the hazardous waste management units located at 23555 Euclid Avenue, Cleveland, Ohio. At the time of approval, Ohio EPA was not authorized to administer the federal RCRA program here in Ohio and so approval of the closure plan by USEPA Region V was required in order for TRW to begin closure activities. USEPA Region V did not approve the closure plan prior to Ohio EPA becoming authorized to administer the federal RCRA program on June 30, 1989. This letter is to inform you that TRW may begin closure activities at the Euclid Avenue site under official State of Ohio and federal approval as agreed by Ohio EPA and USEPA Region V. If you have any questions, please feel free to contact me at (614) 644-2956.

Sincerely,

A handwritten signature in cursive script that reads "Edward A. Kitchen".

Edward A. Kitchen, Manager  
Technical Assistance and Engineering Section  
Division of Solid and Hazardous Waste Management

EAK/PV/pas

cc: Paul Vandermeer, Ohio EPA, DSHWM  
Paul Anderson, Ohio EPA, NEDO  
Francene Norling, USEPA Region V

1948U

TRW Inc.

Executive Offices  
1900 Richmond Road  
Cleveland, OH 44124

TRW  
RECEIVED  
MAR 02 1990  
CLEVELAND ES

February 23, 1990

Dr. Richard L. Shank, Director  
Ohio Environmental Protection Agency  
1800 Watermark Drive  
Columbus, Ohio 43266-0149

Dear Dr. Shank:

TRW inc. is currently conducting a formal closure of three hazardous waste management units at its former facility at 23555 Euclid Avenue in Euclid, Ohio. The closure plan for this facility was approved by the Ohio EPA on August 18, 1989. On February 5, 1990, TRW Inc. requested an extension of one hundred fifty days in order to complete the specified closure activities.

To date, two of the former hazardous waste management units were successfully closed per the provisions of the approved plan. After repeated pressure cleaning operations, metals concentrations in the rinseates were reduced significantly. However, the final rinseate generated from one of the former drum storage areas (Bldg.#45) somewhat exceeded the levels ( MCL's ) for cadmium, lead, and chromium as specified in the closure plan.

In order to further define areas containing residuals, concrete samples were collected at nine randomly established locations per the closure plan. Samples were obtained to a depth of 1/8 to 1/4 inch and EP Toxic characteristic analyses were performed for cadmium, chromium, and lead. Analyses of the nine samples indicated that cadmium, chromium and lead were not present above the EP Toxicity levels for these materials.

One additional sample of concrete previously removed from a visually stained area ( grid location B 27 / B 28 on Figure 6.9 ) indicated the presence of chromium above the EP Toxicity level. It should be noted that samples of areas adjacent to the visually stained area did not contain any metals above the EP Toxic levels (A sampling grid, Figure 6.9, which indicates the locations of the above samples is enclosed).

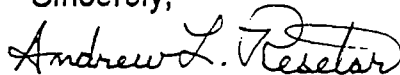
Dr. Richard L. Shank  
Facility Closure Status  
February 23, 1990  
Page 2

TRW Inc. intends to further define the area containing chromium residuals in excess of EP Toxic levels and remove same. Following this operation, TRW Inc. believes that the closure of Bldg.#45 will be complete. At that time, TRW Inc. will submit to your office the certification report from the independent professional engineer certifying that the closure has been completed.

TRW Inc. believes that the work done to date has been in compliance with provisions of the Ohio EPA approved closure plan. We would appreciate any comments which you might have regarding our action plan described above.

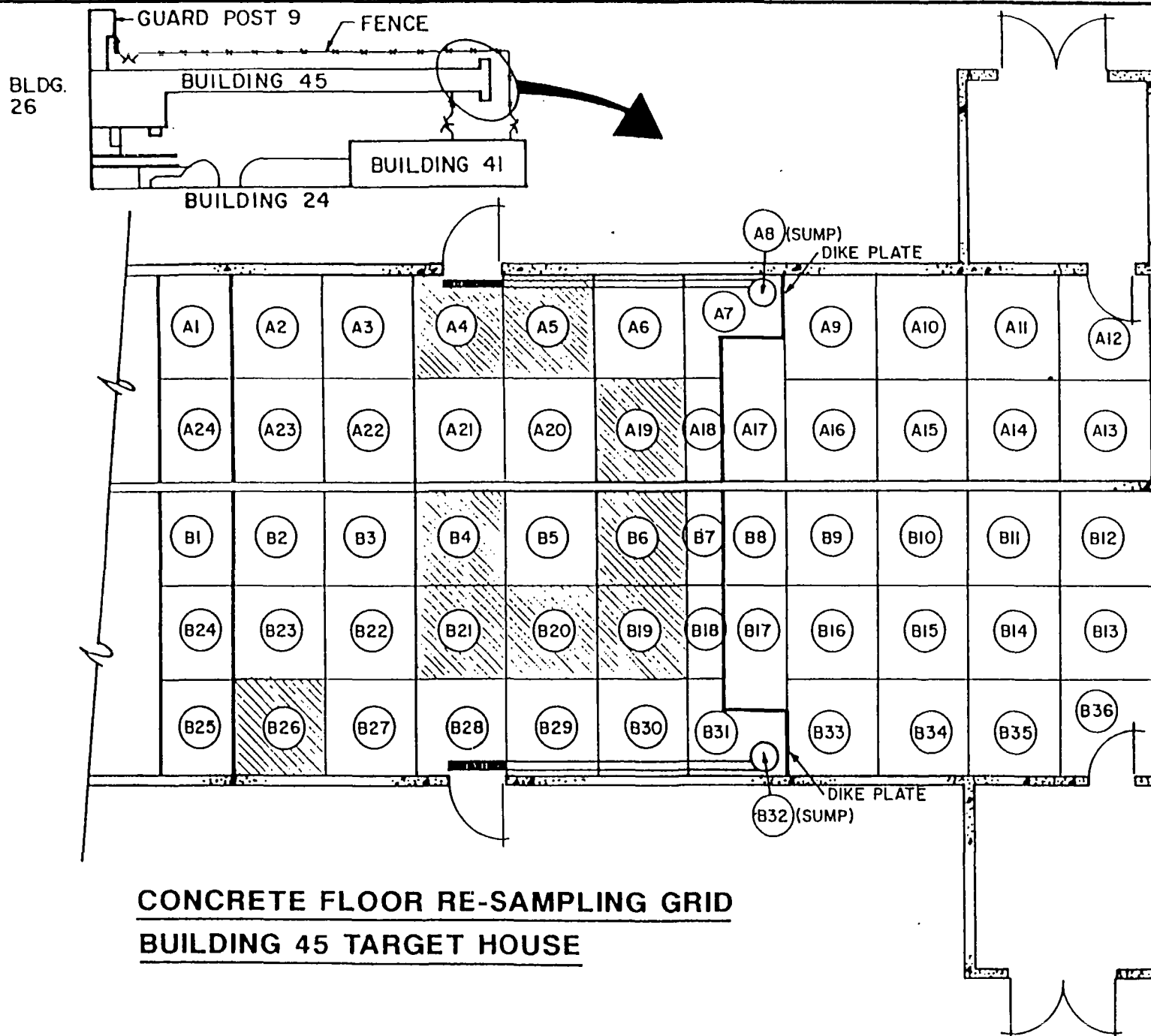
If you have any questions or comments regarding the above, please contact me at 216-291-7839. Your cooperation in this matter is appreciated.

Sincerely,



Andrew L. Resetar  
Environmental Project Manager

cc: P. Anderson, OEPA, Twinsburg  
T. Crepeau, OEPA, Columbus  
M. Lyden, Engineering - Science Inc. ✓  
B.E. Richardson, Argo Tech Corp.  
F.D. Trickey



SCALE: 1/8" = 1' - 0"

**LEGEND:**

 CONCRETE FLOOR  
RE-SAMPLING  
LOCATION

**NOTE:**

PRE-CLOSURE  
CONCRETE SAMPLING  
LOCATIONS SHOWN ON  
FIGURE 5.2 OF  
CLOSURE PLAN

FIGURE 6.9

MAY 14 1990



State of Ohio Environmental Protection Agency

P.O. Box 1049, 1800 WaterMark Dr.  
Columbus, Ohio 43266-0149

I certify this to be a true and accurate copy of the  
official document as filed in the records of the Ohio  
Environmental Protection Agency.

By: Mary Carini Date 5-3-90

Richard F. Celeste  
Governor

CLOSURE PLAN EXTENSION APPROVAL

CERTIFIED MAIL

May 3, 1990

Re: Closure Plan Extension  
TRW, Inc.  
OHD004179453

Mr. A.L. Resetar  
TRW, Inc.  
1900 Richmond Road  
Cleveland, Ohio 44124

OHIO E.P.A.

MAY -3 90

ENTERED DIRECTOR'S JOURNAL

Dear Mr. Resetar:

On February 9, 1990, TRW, Inc. submitted a request for an extension to the closure period specified in the approved closure plan for 150 days (until July 9, 1990). The extension request was submitted pursuant to Rule 3745-66-13(B) of the Ohio Administrative Code (OAC) as closure will require longer than the 180 day period specified in OAC Rule 3745-66-13. TRW, Inc. has requested this extension of time due to inability to clean close the drum storage area.

Therefore, closure of the hazardous waste storage pad will require greater than 180 days because of inability to attain clean closure. TRW, Inc. will continue to take all steps to prevent a threat to human health and the environment from the unclosed but inactive waste management unit per OAC Rule 3745-66-13(B)(2).

The public was given the opportunity to submit written comments regarding the request for extension to the closure period for TRW, Inc. in accordance with OAC Rule 3745-66-13. The public notice appeared the week of March 5, 1990 in the Plain Dealer. No comments were received by Ohio EPA in this matter.

An extension of time allowed for closure is hereby granted for 150 days (until July 9, 1990).

Please be advised that approval of this closure extension request does not release TRW, Inc. from any responsibilities as required under the Hazardous and Solid Waste Amendments of 1984 regarding corrective action for all releases of hazardous waste or constituents from any solid waste management unit, regardless of the time at which waste was placed in the unit.

Notwithstanding compliance with the terms of the closure plan, the Director may, on the basis of any information that there is or has been a release of hazardous waste, hazardous constituents, or hazardous substances into the environment, issue order pursuant to Section 3734.21 et seq of the Revised Code or Chapters 3734 or 6111 of the Revised Code requiring corrective action or such other response as deemed necessary; or initiate appropriate action; or seek any appropriate legal or equitable remedies to abate pollution or contamination or to protect public health or safety or the environment.

Nothing here shall waive the right of the Director to take action beyond the terms of the closure plan pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9611 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499 ("CERCLA") or to take any other action pursuant to applicable Federal or State law, including but not limited to the right to issue a permit with terms and conditions requiring corrective action pursuant to Chapters 3734 or 6111 or the Revised Code; the right to seek injunctive relief, monetary penalties and punitive damages, to undertake any removal, remedial, and/or response action relating to the facility, and to seek recovery for any costs incurred by the Director in undertaking such actions.

You are notified that this action of the Director is final and may be appealed to the Environmental Board of Review pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Board of Review within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency and the Environmental Enforcement Section of the Office of the Attorney General within three (3) days of filing with the Board. An appeal may be filed with the Environmental Board of Review at the following address: Environmental Board of Review, 236 East Town Street, Room 300, Columbus, Ohio 43266-0557.

I certify this to be a true and accurate copy of official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 5-3-90

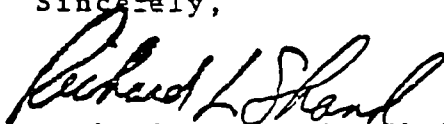
OHIO E.P.A.

MAY -3 90

ENTERED DIRECTOR'S JOURNAL

When closure is completed, the Ohio Administrative Code Rule 3745-26-15 requires the owner or operator of a facility to submit to the Director of the Ohio EPA certification by the owner or operator and a qualified, independent, registered professional engineer that the facility has been closed in accordance with the approved closure plan. The certification by the owner or operator shall include the statement found in OAC 3745-50-42(D). These certifications should be submitted to: Ohio Environmental Protection Agency, Division of Solid and Hazardous Waste Management, Attn: Thomas Crepeau, Data Management Section, P.O. Box 1749, Columbus, Ohio 43266-0149.

Sincerely,

  
Richard L. Shank, Ph.D.

RLS/PLV

cc: Paul L. Vandermeer, Ohio EPA, DSHWM  
Lisa Pierard, USEPA, Region V  
Joel Morbito, USEPA, Region V  
Tom Crepeau, Ohio EPA, DSHWM Central File  
Paul Anderson, Ohio EPA, NEDO

OHIO E.P.A.

MAY -3 90

ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 5-3-90

**APPENDIX B**  
**ANALYTICAL RESULTS**

# TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-#	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	SILVER	1.4	mg/kg	0.5	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	ARSENIC	1.4	mg/kg	0.5	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	BARIUM	40	mg/kg	0.5	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	BERYLLIUM	ND	mg/kg	0.25	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	CADMIUM	3	mg/kg	0.5	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	CHROMIUM	70	mg/kg	1	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	COPPER	40	mg/kg	0.5	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	MERCURY	7	mg/kg	5	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	NICKEL	55	mg/kg	2	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	LEAD	100	mg/kg	2.5	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	ANTIMONY	ND	mg/kg	10	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	SELENIUM	ND	mg/kg	0.5	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	THALLIUM	ND	mg/kg	5	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
-	-	2505	46254	DOCK 2-B	OAK WOOD BLOCK FLOORING	12-Sep-00	15-Sep-00	ZINC	90	mg/kg	0.5	TO PROFILE WOOD BLOCK FLOORING FOR INCINERATION
2-4613	R-18	2573	46518	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	18-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	
2-4613	R-18	2573	46518	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	18-Sep-00	20-Sep-00	CYANIDE	ND	mg/kg	0.1	
2-4614	P-15	2573	46519	POLYGON	SHELBY TUBE SOIL SAMPLE	18-Sep-00	26-Sep-00	PGDN	100	mg/kg	20	
2-4614	P-15	2573	46519	POLYGON	SHELBY TUBE SOIL SAMPLE	18-Sep-00	20-Sep-00	CYANIDE	ND	mg/kg	0.1	
2-4615	R-14	2573	46520	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	18-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	
2-4615	R-14	2573	46520	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	18-Sep-00	20-Sep-00	CYANIDE	ND	mg/kg	0.1	
2-4616	E-1	2573	46521	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	18-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	EXTRA SAMPLE - JUST OUTSIDE POLYGON
2-4616	E-1	2573	46521	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	18-Sep-00	20-Sep-00	CYANIDE	1.3	mg/kg	0.1	EXTRA SAMPLE - JUST OUTSIDE POLYGON
2-4617	R-17	2573	46522	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	18-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	
2-4617	R-17	2573	46522	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	18-Sep-00	20-Sep-00	CYANIDE	ND	mg/kg	0.1	
2-4618	P-14	2573	46512	POLYGON	SHELBY TUBE SOIL SAMPLE	18-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	
2-4618	P-14	2573	46512	POLYGON	SHELBY TUBE SOIL SAMPLE	18-Sep-00	20-Sep-00	CYANIDE	ND	mg/kg	0.1	
2-4619	E-2	2573	46513	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	18-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	EXTRA SAMPLE - DRAIN TILE PATH
2-4619	E-2	2573	46513	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	18-Sep-00	20-Sep-00	CYANIDE	ND	mg/kg	0.1	EXTRA SAMPLE - DRAIN TILE PATH
2-4620	P-7	2573	46514	POLYGON	SHELBY TUBE SOIL SAMPLE	18-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	
2-4620	P-7	2573	46514	POLYGON	SHELBY TUBE SOIL SAMPLE	18-Sep-00	20-Sep-00	CYANIDE	ND	mg/kg	0.1	
2-4621	P-17	2573	46515	POLYGON	SHELBY TUBE SOIL SAMPLE	18-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	
2-4621	P-17	2573	46515	POLYGON	SHELBY TUBE SOIL SAMPLE	18-Sep-00	20-Sep-00	CYANIDE	ND	mg/kg	0.1	
2-4622	P-21	2573	46516	POLYGON	SHELBY TUBE SOIL SAMPLE	18-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	
2-4622	P-21	2573	46516	POLYGON	SHELBY TUBE SOIL SAMPLE	18-Sep-00	20-Sep-00	CYANIDE	ND	mg/kg	0.1	
2-4623	P-24	2573	46517	POLYGON	SHELBY TUBE SOIL SAMPLE	18-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	
2-4623	P-24	2573	46517	POLYGON	SHELBY TUBE SOIL SAMPLE	18-Sep-00	20-Sep-00	CYANIDE	ND	mg/kg	0.1	
2-4675	-	2573	46510	SEP. TANK	WATER SAMPLE	18-Sep-00	26-Sep-00	PGDN	950	mg/l	200	
2-4674	-	2573	46511	HOLDING TANKS	WATER SAMPLE	18-Sep-00	26-Sep-00	PGDN	0.6	mg/l	0.2	
2-4663	-	2566	46547	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	19-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	BLIND DUPLICATE #1 TAKEN AT R-17
2-4663	-	2566	46547	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	19-Sep-00	21-Sep-00	CYANIDE	0.5	mg/kg	0.1	BLIND DUPLICATE #1 TAKEN AT R-17
2-4624	E-3	2566	46548	RUNOFF STREAM	GRAB SAMPLE SOIL	19-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	FROM INSIDE OF LAST DRAIN TILE EXPOSED
2-4624	E-3	2566	46548	RUNOFF STREAM	GRAB SAMPLE SOIL	19-Sep-00	21-Sep-00	CYANIDE	0.2	mg/kg	0.1	FROM INSIDE OF LAST DRAIN TILE EXPOSED
2-4625	E-4	2566	46549	RUNOFF STREAM	GRAB SAMPLE SOIL	19-Sep-00	26-Sep-00	PGDN	ND	mg/kg	20	FROM OUTSIDE OF LAST DRAIN TILE EXPOSED
2-4625	E-4	2566	46549	RUNOFF STREAM	GRAB SAMPLE SOIL	19-Sep-00	21-Sep-00	CYANIDE	ND	mg/kg	0.1	FROM OUTSIDE OF LAST DRAIN TILE EXPOSED
2-4661	-	2566	46550	SEP. TANK	WATER SAMPLE	19-Sep-00	21-Sep-00	CYANIDE	ND	mg/l	0.01	TO PROFILE FOR DISPOSAL
2-4662	-	2566	46551	HOLDING TANKS	WATER SAMPLE	19-Sep-00	21-Sep-00	CYANIDE	0.28	mg/l	0.01	TO PROFILE FOR DISPOSAL
2-4626.27	E-5	2566	46552	SEP. TANK	GRAB SAMPLE SOIL	19-Sep-00	25-Sep-00	VOLATILES	ND			BLACK SAND, STRONG SOLVENT ODOR, NO PRIORITY
2-4626.27	E-5	2566	46552	SEP. TANK	GRAB SAMPLE SOIL	19-Sep-00	21-Sep-00	CYANIDE	ND	mg/kg	0.1	POLUTANTS BY METHOD 8240, MASS SPEC SHOWED SOME
2-4626.27	E-5	2566	46552	SEP. TANK	GRAB SAMPLE SOIL	19-Sep-00	26-Sep-00	PGDN	ND	mg/kg	200	UNKNOWN
2-4626.27	E-5	2566	46552	SEP. TANK	GRAB SAMPLE SOIL	19-Sep-00	22-Sep-00	FL. POINT	>210	Deg. F	-	

# TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S #	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
2-4828	D-1	2840	46762	DEBRIS PILE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4828	D-1	2840	46762	DEBRIS PILE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	27-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4829	D-2	2840	46763	DEBRIS PILE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4829	D-2	2840	46763	DEBRIS PILE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	27-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4830	DP-1	2840	46764	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4830	DP-1	2840	46764	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	27-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4831	DP-2	2840	46765	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4831	DP-2	2840	46765	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	27-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4832	DP-3	2840	46766	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4832	DP-3	2840	46766	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	27-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4833	DP-4	2840	46767	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4833	DP-4	2840	46767	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	27-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4834	DP-5	2840	46768	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4834	DP-5	2840	46768	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	27-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4835	DP-6	2840	46769	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4835	DP-6	2840	46769	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	27-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4836	DP-12	2840	46770	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4836	DP-12	2840	46770	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4837	DP-13	2840	46771	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4837	DP-13	2840	46771	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4838	DP-14	2840	46772	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4838	DP-14	2840	46772	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4839	DP-15	2840	46773	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4839	DP-15	2840	46773	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	0.8	mg/kg	0.1	
2-4840	DP-16	2840	46774	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4840	DP-16	2840	46774	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4841	DP-17	2840	46775	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4841	DP-17	2840	46775	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4842	DP-18	2840	46776	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4842	DP-18	2840	46776	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4843	DP-19	2840	46777	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4843	DP-19	2840	46777	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4844	DP-20	2840	46778	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4844	DP-20	2840	46778	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4845	DP-21	2840	46779	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4845	DP-21	2840	46779	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4846	DP-22	2840	46780	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4846	DP-22	2840	46780	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4847	DP-23	2840	46781	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	
2-4847	DP-23	2840	46781	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	
2-4854	-	2840	46782	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	BLIND DUPLICATE #2, TAKEN AT DP-14
2-4854	-	2840	46782	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	BLIND DUPLICATE #2, TAKEN AT DP-14
2-4855	-	2840	46783	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	BLIND DUPLICATE #3, TAKEN AT DP-2
2-4855	-	2840	46783	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	25-Sep-80	28-Sep-80	CYANIDE	ND	mg/kg	0.1	BLIND DUPLICATE #3, TAKEN AT DP-2
2-4848	SP-1	2852	46887	STOCKPILE	SHELBY TUBE SOIL SAMPLE	26-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	MATERIAL REMOVED FROM HOLDING TANK AREA
2-4848	SP-1	2852	46887	STOCKPILE	SHELBY TUBE SOIL SAMPLE	26-Sep-80	02-Oct-80	CYANIDE	0.2	mg/kg	0.1	MATERIAL REMOVED FROM HOLDING TANK AREA
2-4849	SP-2	2852	46888	STOCKPILE	SHELBY TUBE SOIL SAMPLE	26-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	MATERIAL REMOVED FROM HOLDING TANK AREA
2-4849	SP-2	2852	46888	STOCKPILE	SHELBY TUBE SOIL SAMPLE	26-Sep-80	02-Oct-80	CYANIDE	0.3	mg/kg	0.1	MATERIAL REMOVED FROM HOLDING TANK AREA
2-4850	SP-3	2852	46889	STOCKPILE	SHELBY TUBE SOIL SAMPLE	26-Sep-80	30-Sep-80	PGDN	ND	mg/kg	20	MATERIAL REMOVED FROM HOLDING TANK AREA
2-4850	SP-3	2852	46889	STOCKPILE	SHELBY TUBE SOIL SAMPLE	26-Sep-80	02-Oct-80	CYANIDE	0.6	mg/kg	0.1	MATERIAL REMOVED FROM HOLDING TANK AREA

# TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S #	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
2-4851	P-10	2691	47030	POLYGON	SHELBY TUBE SOIL SAMPLE	29-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	
2-4851	P-10	2691	47030	POLYGON	SHELBY TUBE SOIL SAMPLE	29-Sep-89	03-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4852	P-4	2691	47031	POLYGON	SHELBY TUBE SOIL SAMPLE	29-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	
2-4852	P-4	2691	47031	POLYGON	SHELBY TUBE SOIL SAMPLE	29-Sep-89	03-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4853	P-27	2691	47032	POLYGON	SHELBY TUBE SOIL SAMPLE	29-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	
2-4853	P-27	2691	47032	POLYGON	SHELBY TUBE SOIL SAMPLE	29-Sep-89	03-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4854	E-6	2691	47033	POLYGON	SHELBY TUBE SOIL SAMPLE	29-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	EXTRA SAMPLE TAKEN AT P-15 AFTER ADTL SOIL REMOVAL
2-4854	E-6	2691	47033	POLYGON	SHELBY TUBE SOIL SAMPLE	29-Sep-89	03-Oct-89	CYANIDE	ND	mg/kg	0.1	EXTRA SAMPLE TAKEN AT P-15 AFTER ADTL SOIL REMOVAL
2-4855	ST-1	2691	47034	SEP. TANK	SHELBY TUBE SOIL SAMPLE	29-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	TAKEN THROUGH HOLE HAMMERED THROUGH ANCHOR SLAB
2-4855	ST-1	2691	47034	SEP. TANK	SHELBY TUBE SOIL SAMPLE	29-Sep-89	03-Oct-89	CYANIDE	ND	mg/kg	0.1	TAKEN THROUGH HOLE HAMMERED THROUGH ANCHOR SLAB
2-4856	ST-2	2691	47035	SEP. TANK	SHELBY TUBE SOIL SAMPLE	29-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	TAKEN THROUGH HOLE HAMMERED THROUGH ANCHOR SLAB
2-4856	ST-2	2691	47035	SEP. TANK	SHELBY TUBE SOIL SAMPLE	29-Sep-89	03-Oct-89	CYANIDE	ND	mg/kg	0.1	TAKEN THROUGH HOLE HAMMERED THROUGH ANCHOR SLAB
2-4857	ST-3	2691	47036	SEP. TANK	SHELBY TUBE SOIL SAMPLE	29-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	
2-4857	ST-3	2691	47036	SEP. TANK	SHELBY TUBE SOIL SAMPLE	29-Sep-89	04-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4858	ST-4	2691	47037	SEP. TANK	SHELBY TUBE SOIL SAMPLE	29-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	
2-4858	ST-4	2691	47037	SEP. TANK	SHELBY TUBE SOIL SAMPLE	29-Sep-89	04-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4859	DP-11	2691	47038	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	29-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	
2-4859	DP-11	2691	47038	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	29-Sep-89	04-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4859	-	2691	47039	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	29-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	BLIND DUPLICATE #4, TAKEN AT DP-11
2-4859	-	2691	47039	DISCH. PIPE	SHELBY TUBE SOIL SAMPLE	29-Sep-89	04-Oct-89	CYANIDE	ND	mg/kg	0.1	BLIND DUPLICATE #4, TAKEN AT DP-11
2-4860	IP-8	2691	47040	INLET PIPE	SHELBY TUBE SOIL SAMPLE	29-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	
2-4860	IP-8	2691	47040	INLET PIPE	SHELBY TUBE SOIL SAMPLE	29-Sep-89	04-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4861	E-7	2691	47041	SEP. TANK	SHELBY TUBE SOIL SAMPLE	29-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	PUSHED HORIZONTALLY TOWARDS BUILDING
2-4861	E-7	2691	47041	SEP. TANK	SHELBY TUBE SOIL SAMPLE	29-Sep-89	04-Oct-89	CYANIDE	ND	mg/kg	0.1	PUSHED HORIZONTALLY TOWARDS BUILDING
2-4862	HT-1	2691	47042	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	30-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	THROUGH HOLE IN BOTTOM OF N. TANK ENCASEMENT
2-4862	HT-1	2691	47042	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	30-Sep-89	04-Oct-89	CYANIDE	ND	mg/kg	0.1	THROUGH HOLE IN BOTTOM OF N. TANK ENCASEMENT
2-4863	HT-1	2691	47043	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	30-Sep-89	06-Oct-89	PGDN	ND	mg/kg	20	THROUGH HOLE IN BOTTOM OF N. TANK ENCASEMENT
2-4863	HT-1	2691	47043	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	30-Sep-89	04-Oct-89	CYANIDE	ND	mg/kg	0.1	THROUGH HOLE IN BOTTOM OF N. TANK ENCASEMENT
2-4864	R-5	2713	47122	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	02-Oct-89	04-Oct-89	PGDN	ND	mg/kg	20	
2-4864	R-5	2713	47122	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	02-Oct-89	04-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4865	R-8	2713	47123	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	02-Oct-89	04-Oct-89	PGDN	ND	mg/kg	20	
2-4865	R-8	2713	47123	RUNOFF STREAM	SHELBY TUBE SOIL SAMPLE	02-Oct-89	04-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4866	E-8	2743	47228	HOLDING TANKS	CONCRETE SAMPLE-TANK TOPS	05-Oct-89	07-Oct-89	PGDN	63	mg/kg	20	WORST CASE STAINED CONCRETE FROM JOINT AREA
2-4866	E-8	2743	47228	HOLDING TANKS	CONCRETE SAMPLE-TANK TOPS	05-Oct-89	09-Oct-89	CYANIDE	6.5	mg/kg	0.1	WORST CASE STAINED CONCRETE FROM JOINT AREA
2-4867	E-9	2743	47229	HOLDING TANKS	CONC.-MIDDLE TANK BOTTOM	05-Oct-89	07-Oct-89	PGDN	29	mg/kg	20	WORST CASE STAINED CONCRETE FROM JOINT AREA
2-4867	E-9	2743	47229	HOLDING TANKS	CONC.-MIDDLE TANK BOTTOM	05-Oct-89	09-Oct-89	CYANIDE	15	mg/kg	0.1	WORST CASE STAINED CONCRETE FROM JOINT AREA
2-4868	E-10	2743	47230	HOLDING TANKS	CONC.-SOUTH TANK BOTTOM	05-Oct-89	07-Oct-89	PGDN	37	mg/kg	20	WORST CASE STAINED CONCRETE FROM JOINT AREA
2-4868	E-10	2743	47230	HOLDING TANKS	CONC.-SOUTH TANK BOTTOM	05-Oct-89	09-Oct-89	CYANIDE	19	mg/kg	0.1	WORST CASE STAINED CONCRETE FROM JOINT AREA
2-4869	-	2750	47243	FRAC TANK #1	WATER SAMPLE	05-Oct-89	06-Oct-89	CYANIDE	0.2	mg/l	0.01	
2-4869	-	2750	47243	FRAC TANK #1	WATER SAMPLE	05-Oct-89	11-Oct-89	AM.Cn	0.2	mg/l	0.01	
2-4870	-	2750	47244	FRAC TANK #1	WATER SAMPLE	05-Oct-89	10-Oct-89	SILVER	ND	mg/l	0.02	
2-4870	-	2750	47244	FRAC TANK #1	WATER SAMPLE	05-Oct-89	09-Oct-89	ARSENIC	ND	mg/l	0.005	
2-4870	-	2750	47244	FRAC TANK #1	WATER SAMPLE	05-Oct-89	10-Oct-89	BARIIUM	ND	mg/l	0.2	
2-4870	-	2750	47244	FRAC TANK #1	WATER SAMPLE	05-Oct-89	10-Oct-89	CADMIUM	ND	mg/l	0.02	
2-4870	-	2750	47244	FRAC TANK #1	WATER SAMPLE	05-Oct-89	10-Oct-89	CHROMIUM	ND	mg/l	0.05	
2-4870	-	2750	47244	FRAC TANK #1	WATER SAMPLE	05-Oct-89	10-Oct-89	COPPER	ND	mg/l	0.02	
2-4870	-	2750	47244	FRAC TANK #1	WATER SAMPLE	05-Oct-89	11-Oct-89	MERCURY	ND	mg/l	0.005	
2-4870	-	2750	47244	FRAC TANK #1	WATER SAMPLE	05-Oct-89	10-Oct-89	NICKEL	ND	mg/l	0.1	

## TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S #	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
2-4870	-	2750	47244	FRAC TANK #1	WATER SAMPLE	05-Oct-89	10-Oct-89	LEAD	ND	mg/l	0.1	
2-4870	-	2750	47244	FRAC TANK #1	WATER SAMPLE	05-Oct-89	10-Oct-89	SELENIUM	ND	mg/l	0.005	
2-4870	-	2750	47244	FRAC TANK #1	WATER SAMPLE	05-Oct-89	10-Oct-89	ZINC	0.03	mg/l	0.01	
2-4871	-	2750	47245	FRAC TANK #1	WATER SAMPLE	05-Oct-89	10-Oct-89	PGON	110	mg/l	10	
2-4872	-	2750	47246	FRAC TANK #1	WATER SAMPLE	05-Oct-89	10-Oct-89	PGON	110	mg/l	10	
2-4873	E-11	2750	47247	DUMPSTER	COMPOSITED SOIL SAMPLE	05-Oct-89	09-Oct-89	PGON	ND	mg/kg	20	FROM DUMPSTER OF MATERIAL FROM SEP. TANK AREA
2-4873	E-11	2750	47247	DUMPSTER	COMPOSITED SOIL SAMPLE	05-Oct-89	06-Oct-89	CYANIDE	0.1	mg/kg	0.02	FROM DUMPSTER OF MATERIAL FROM SEP. TANK AREA
2-4874	E-12	2750	47248	STOCKPILE	COMPOSITED SOIL SAMPLE	05-Oct-89	09-Oct-89	PGON	ND	mg/kg	20	MATERIAL REMOVED FROM HOLDING TANK AREA
2-4874	E-12	2750	47248	STOCKPILE	COMPOSITED SOIL SAMPLE	05-Oct-89	06-Oct-89	CYANIDE	0.7	mg/kg	0.02	MATERIAL REMOVED FROM HOLDING TANK AREA
2-4875	HT-2	2750	47249	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	05-Oct-89	09-Oct-89	PGON	ND	mg/kg	20	FROM BESIDE ENCASEMENT, NORTH TANK
2-4875	HT-2	2750	47249	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	05-Oct-89	06-Oct-89	CYANIDE	1.1	mg/kg	0.02	FROM BESIDE ENCASEMENT, NORTH TANK
2-4876	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	12-Oct-89	CYANIDE	ND	mg/l	0.01	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	17-Oct-89	SILVER	ND	mg/l	0.02	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	12-Oct-89	ARSENIC	ND	mg/l	0.005	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	13-Oct-89	BERYLLIUM	ND	mg/l	0.01	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	12-Oct-89	CADMIUM	ND	mg/l	0.02	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	13-Oct-89	CHROMIUM	ND	mg/l	0.05	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	17-Oct-89	COPPER	ND	mg/l	0.02	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	13-Oct-89	MERCURY	ND	mg/l	0.005	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	17-Oct-89	NICKEL	ND	mg/l	0.1	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	12-Oct-89	LEAD	ND	mg/l	0.1	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	18-Oct-89	ANTIMONY	ND	mg/l	0.5	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	12-Oct-89	SELENIUM	ND	mg/l	0.005	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	17-Oct-89	THALLIUM	ND	mg/l	0.1	
2-4877	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	16-Oct-89	ZINC	0.02	mg/l	0.01	
2-4878-81	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	11-Oct-89	VOLATILES	ND	ug/l	VARIES	NO VOLATILES DETECTED PER METHOD 8010/8020 - GC
2-4878-81	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	10-Oct-89	DIOXANE	ND	ug/l	1000	METHOD 8015
2-4878-81	-	2708	47431	DOCK 2-B	FIELD RINSE BLANK	09-Oct-89	10-Oct-89	MEX	ND	ug/l	10	METHOD 8015
2-4882	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	12-Oct-89	CYANIDE	ND	mg/l	0.01	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	17-Oct-89	SILVER	ND	mg/l	0.02	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	12-Oct-89	ARSENIC	0.02	mg/l	0.005	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	13-Oct-89	BERYLLIUM	ND	mg/l	0.01	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	12-Oct-89	CADMIUM	0.04	mg/l	0.02	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	13-Oct-89	CHROMIUM	0.22	mg/l	0.05	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	17-Oct-89	COPPER	0.25	mg/l	0.02	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	13-Oct-89	MERCURY	0.02	mg/l	0.005	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	17-Oct-89	NICKEL	0.11	mg/l	0.1	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	12-Oct-89	LEAD	1.6	mg/l	0.1	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	18-Oct-89	ANTIMONY	ND	mg/l	0.5	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	12-Oct-89	SELENIUM	ND	mg/l	0.005	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	17-Oct-89	THALLIUM	ND	mg/l	0.1	
2-4883	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	16-Oct-89	ZINC	3.7	mg/l	0.1	
2-4884-87	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	11-Oct-89	VOLATILES	ND	ug/l	VARIES	ALL ND EXCEPT THOSE BELOW PER METHOD 8010/8020 - GC
2-4884-87	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	11-Oct-89	⊗RIGHT	1.4	ug/l	1	(Tetrachloroethylene) PER METHOD 8010/8020 - GC
2-4884-87	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	11-Oct-89	⊗RIGHT	6	ug/l	1	(1,1,1-Trichloroethane) PER METHOD 8010/8020 - GC
2-4884-87	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	10-Oct-89	DIOXANE	ND	ug/l	1000	METHOD 8015
2-4884-87	-	2708	47432	DOCK 2-B	FIRST RINSE	09-Oct-89	10-Oct-89	MEX	36	ug/l	10	METHOD 8015
2-4888	-	2708	47433	DOCK 2-B	SECOND RINSE	09-Oct-89	12-Oct-89	CYANIDE	ND	mg/l	0.01	
2-4889	-	2708	47433	DOCK 2-B	SECOND RINSE	09-Oct-89	17-Oct-89	SILVER	ND	mg/l	0.02	

# TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
2-4880	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	12-Oct-80	ARSENIC	0.02	mg/l	0.008	
2-4880	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	13-Oct-80	BERYLLIUM	ND	mg/l	0.01	
2-4880	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	12-Oct-80	CADMIUM	0.03	mg/l	0.02	
2-4880	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	13-Oct-80	CHROMIUM	0.2	mg/l	0.05	
2-4880	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	17-Oct-80	COPPER	0.23	mg/l	0.02	
2-4880	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	13-Oct-80	MERCURY	0.02	mg/l	0.005	
2-4880	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	17-Oct-80	NICKEL	0.11	mg/l	0.1	
2-4880	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	12-Oct-80	LEAD	1.1	mg/l	0.1	
2-4880	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	18-Oct-80	ANTIMONY	ND	mg/l	0.5	
2-4880	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	12-Oct-80	SELENIUM	ND	mg/l	0.005	
2-4880	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	17-Oct-80	THALLIUM	ND	mg/l	0.1	
2-4880	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	18-Oct-80	ZINC	1.2	mg/l	0.1	
2-4890-03	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	11-Oct-80	VOLATILES	ND	ug/l	VARIES	ALL ND EXCEPT THOSE BELOW PER METHOD 8010/8020 - GC
2-4890-03	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	11-Oct-80	@RIGHT	1	ug/l	1	(Tetrachloroethylene) PER METHOD 8010/8020 - GC
2-4890-03	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	11-Oct-80	@RIGHT	8	ug/l	1	(1,1,1-Trichloroethane) PER METHOD 8010/8020 - GC
2-4890-03	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	10-Oct-80	DIOXANE	ND	ug/l	1000	METHOD 8015
2-4890-03	-	2798	47433	DOCK 2-B	SECOND RINSE	09-Oct-80	10-Oct-80	MEK	36	ug/l	10	METHOD 8015
2-4894	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	12-Oct-80	CYANIDE	ND	mg/l	0.01	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	17-Oct-80	SILVER	ND	mg/l	0.02	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	12-Oct-80	ARSENIC	0.01	mg/l	0.005	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	13-Oct-80	BERYLLIUM	ND	mg/l	0.01	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	12-Oct-80	CADMIUM	0.02	mg/l	0.02	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	13-Oct-80	CHROMIUM	0.13	mg/l	0.05	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	17-Oct-80	COPPER	0.15	mg/l	0.02	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	13-Oct-80	MERCURY	0.005	mg/l	0.005	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	17-Oct-80	NICKEL	ND	mg/l	0.1	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	12-Oct-80	LEAD	0.5	mg/l	0.1	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	18-Oct-80	ANTIMONY	ND	mg/l	0.5	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	12-Oct-80	SELENIUM	ND	mg/l	0.005	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	17-Oct-80	THALLIUM	ND	mg/l	0.1	
2-4895	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	18-Oct-80	ZINC	0.58	mg/l	0.1	
2-4895-00	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	11-Oct-80	VOLATILES	ND	ug/l	VARIES	ALL ND EXCEPT THOSE BELOW PER METHOD 8010/8020 - GC
2-4895-00	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	11-Oct-80	@RIGHT	ND	ug/l	1	(Tetrachloroethylene) PER METHOD 8010/8020 - GC
2-4895-00	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	11-Oct-80	@RIGHT	5	ug/l	1	(1,1,1-Trichloroethane) PER METHOD 8010/8020 - GC
2-4895-00	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	10-Oct-80	DIOXANE	ND	ug/l	1000	METHOD 8015
2-4895-00	-	2798	47434	DOCK 2-B	THIRD RINSE	09-Oct-80	10-Oct-80	MEK	25	ug/l	10	METHOD 8015
2-4897	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	12-Oct-80	CYANIDE	ND	mg/l	0.01	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	17-Oct-80	SILVER	ND	mg/l	0.02	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	12-Oct-80	ARSENIC	0.008	mg/l	0.005	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	13-Oct-80	BERYLLIUM	ND	mg/l	0.01	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	12-Oct-80	CADMIUM	0.02	mg/l	0.02	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	13-Oct-80	CHROMIUM	0.11	mg/l	0.05	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	17-Oct-80	COPPER	0.14	mg/l	0.02	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	13-Oct-80	MERCURY	0.005	mg/l	0.005	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	17-Oct-80	NICKEL	ND	mg/l	0.1	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	12-Oct-80	LEAD	0.57	mg/l	0.1	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	18-Oct-80	ANTIMONY	ND	mg/l	0.5	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	12-Oct-80	SELENIUM	ND	mg/l	0.005	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	17-Oct-80	THALLIUM	ND	mg/l	0.1	
2-4898	-	2798	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	18-Oct-80	ZINC	0.53	mg/l	0.1	

# TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S #	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
2-4060-72	-	2708	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	11-Oct-80	VOLATILES	ND	ug/l	VARIES	ALL NO EXCEPT THOSE BELOW PER METHOD 8010/8020 - GC
2-4060-72	-	2708	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	11-Oct-80	@RIGHT	1.2	ug/l	1	(Tetrachloroethylene) PER METHOD 8010/8020 - GC
2-4060-72	-	2708	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	11-Oct-80	@RIGHT	5	ug/l	1	(1,1,1-Trichloroethane) PER METHOD 8010/8020 - GC
2-4060-72	-	2708	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	10-Oct-80	DIOXANE	ND	ug/l	1000	METHOD 8015
2-4060-72	-	2708	47435	DOCK 2-B	BLIND DUPLICATE	09-Oct-80	10-Oct-80	MEK	31	ug/l	10	METHOD 8015
2-4000	-	2831	47563	BLDG. 45-B	FIELD RINSE BLANK	12-Oct-80	17-Oct-80	SILVER	ND	mg/l	0.02	
2-4000	-	2831	47563	BLDG. 45-B	FIELD RINSE BLANK	12-Oct-80	19-Oct-80	ARSENIC	ND	mg/l	0.005	
2-4000	-	2831	47563	BLDG. 45-B	FIELD RINSE BLANK	12-Oct-80	18-Oct-80	BARIUM	ND	mg/l	0.2	
2-4000	-	2831	47563	BLDG. 45-B	FIELD RINSE BLANK	12-Oct-80	18-Oct-80	CADMIUM	ND	mg/l	0.02	
2-4000	-	2831	47563	BLDG. 45-B	FIELD RINSE BLANK	12-Oct-80	18-Oct-80	CHROMIUM	ND	mg/l	0.05	
2-4000	-	2831	47563	BLDG. 45-B	FIELD RINSE BLANK	12-Oct-80	13-Oct-80	MERCURY	ND	mg/l	0.005	
2-4000	-	2831	47563	BLDG. 45-B	FIELD RINSE BLANK	12-Oct-80	16-Oct-80	LEAD	ND	mg/l	0.1	
2-4000	-	2831	47563	BLDG. 45-B	FIELD RINSE BLANK	12-Oct-80	19-Oct-80	SELENIUM	ND	mg/l	0.005	
2-4001	-	2831	47564	BLDG. 45-B	FIRST RINSE	12-Oct-80	17-Oct-80	SILVER	0.02	mg/l	0.02	
2-4001	-	2831	47564	BLDG. 45-B	FIRST RINSE	12-Oct-80	19-Oct-80	ARSENIC	0.056	mg/l	0.005	
2-4001	-	2831	47564	BLDG. 45-B	FIRST RINSE	12-Oct-80	18-Oct-80	BARIUM	1.2	mg/l	0.2	
2-4001	-	2831	47564	BLDG. 45-B	FIRST RINSE	12-Oct-80	18-Oct-80	CADMIUM	0.06	mg/l	0.02	
2-4001	-	2831	47564	BLDG. 45-B	FIRST RINSE	12-Oct-80	18-Oct-80	CHROMIUM	3.7	mg/l	0.05	
2-4001	-	2831	47564	BLDG. 45-B	FIRST RINSE	12-Oct-80	13-Oct-80	MERCURY	0.006	mg/l	0.005	
2-4001	-	2831	47564	BLDG. 45-B	FIRST RINSE	12-Oct-80	16-Oct-80	LEAD	100	mg/l	20	
2-4001	-	2831	47564	BLDG. 45-B	FIRST RINSE	12-Oct-80	19-Oct-80	SELENIUM	ND	mg/l	0.005	
2-4002	-	2831	47565	BLDG. 45-B	SECOND RINSE	12-Oct-80	17-Oct-80	SILVER	ND	mg/l	0.02	
2-4002	-	2831	47565	BLDG. 45-B	SECOND RINSE	12-Oct-80	19-Oct-80	ARSENIC	0.01	mg/l	0.005	
2-4002	-	2831	47565	BLDG. 45-B	SECOND RINSE	12-Oct-80	18-Oct-80	BARIUM	0.36	mg/l	0.2	
2-4002	-	2831	47565	BLDG. 45-B	SECOND RINSE	12-Oct-80	18-Oct-80	CADMIUM	0.18	mg/l	0.02	
2-4002	-	2831	47565	BLDG. 45-B	SECOND RINSE	12-Oct-80	18-Oct-80	CHROMIUM	1.3	mg/l	0.05	
2-4002	-	2831	47565	BLDG. 45-B	SECOND RINSE	12-Oct-80	13-Oct-80	MERCURY	ND	mg/l	0.005	
2-4002	-	2831	47565	BLDG. 45-B	SECOND RINSE	12-Oct-80	16-Oct-80	LEAD	36	mg/l	2	
2-4002	-	2831	47565	BLDG. 45-B	SECOND RINSE	12-Oct-80	19-Oct-80	SELENIUM	ND	mg/l	0.005	
2-4003	-	2831	47566	BLDG. 45-B	THIRD RINSE	12-Oct-80	17-Oct-80	SILVER	ND	mg/l	0.02	
2-4003	-	2831	47566	BLDG. 45-B	THIRD RINSE	12-Oct-80	19-Oct-80	ARSENIC	0.014	mg/l	0.005	
2-4003	-	2831	47566	BLDG. 45-B	THIRD RINSE	12-Oct-80	18-Oct-80	BARIUM	0.23	mg/l	0.2	
2-4003	-	2831	47566	BLDG. 45-B	THIRD RINSE	12-Oct-80	18-Oct-80	CADMIUM	0.03	mg/l	0.02	
2-4003	-	2831	47566	BLDG. 45-B	THIRD RINSE	12-Oct-80	18-Oct-80	CHROMIUM	1.1	mg/l	0.05	
2-4003	-	2831	47566	BLDG. 45-B	THIRD RINSE	12-Oct-80	13-Oct-80	MERCURY	ND	mg/l	0.005	
2-4003	-	2831	47566	BLDG. 45-B	THIRD RINSE	12-Oct-80	16-Oct-80	LEAD	22	mg/l	2	
2-4003	-	2831	47566	BLDG. 45-B	THIRD RINSE	12-Oct-80	19-Oct-80	SELENIUM	ND	mg/l	0.005	
2-4050	-	2831	47567	BLDG. 45-B	BLIND DUPLICATE	12-Oct-80	17-Oct-80	SILVER	ND	mg/l	0.02	
2-4050	-	2831	47567	BLDG. 45-B	BLIND DUPLICATE	12-Oct-80	19-Oct-80	ARSENIC	0.014	mg/l	0.005	
2-4050	-	2831	47567	BLDG. 45-B	BLIND DUPLICATE	12-Oct-80	18-Oct-80	BARIUM	0.24	mg/l	0.2	
2-4050	-	2831	47567	BLDG. 45-B	BLIND DUPLICATE	12-Oct-80	18-Oct-80	CADMIUM	0.03	mg/l	0.02	
2-4050	-	2831	47567	BLDG. 45-B	BLIND DUPLICATE	12-Oct-80	18-Oct-80	CHROMIUM	1.1	mg/l	0.05	
2-4050	-	2831	47567	BLDG. 45-B	BLIND DUPLICATE	12-Oct-80	13-Oct-80	MERCURY	ND	mg/l	0.005	
2-4050	-	2831	47567	BLDG. 45-B	BLIND DUPLICATE	12-Oct-80	16-Oct-80	LEAD	24	mg/l	2	
2-4050	-	2831	47567	BLDG. 45-B	BLIND DUPLICATE	12-Oct-80	19-Oct-80	SELENIUM	ND	mg/l	0.005	
2-4904	-	2831	47568	BLDG. 45-B	FIELD RINSE BLANK	12-Oct-80	13-Oct-80	VOLATILES	ND	ug/l	VARIES	NO VOLATILES DETECTED PER METHOD 8010/8020 - GC
2-4905	-	2831	47569	BLDG. 45-B	FIRST RINSE	12-Oct-80	13-Oct-80	VOLATILES	ND	ug/l	VARIES	ALL NO EXCEPT THOSE BELOW PER METHOD 8010/8020 - GC
2-4906	-	2831	47569	BLDG. 45-B	FIRST RINSE	12-Oct-80	13-Oct-80	TOLUENE	1.4	ug/l	1	(Toluene) PER METHOD 8010/8020 - GC
2-4906	-	2831	47570	BLDG. 45-B	SECOND RINSE	12-Oct-80	13-Oct-80	VOLATILES	ND	ug/l	VARIES	ALL NO EXCEPT THOSE BELOW PER METHOD 8010/8020 - GC
2-4906	-	2831	47570	BLDG. 45-B	SECOND RINSE	12-Oct-80	13-Oct-80	TOLUENE	1.2	ug/l	1	(Toluene) PER METHOD 8010/8020 - GC

# TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S #	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
2-4007	-	2831	47571	BLDG. 45-B	THIRD RINSE	12-Oct-89	13-Oct-89	VOLATILES	ND	ug/l	VARIES	ALL ND EXCEPT THOSE BELOW PER METHOD 8010/8020 - GC
2-4007	-	2831	47571	BLDG. 45-B	THIRD RINSE	12-Oct-89	13-Oct-89	TOLUENE	ND	ug/l	1	(Toluene) PER METHOD 8010/8020 - GC
2-4051	-	2831	47572	BLDG. 45-B	BLIND DUPLICATE	12-Oct-89	13-Oct-89	VOLATILES	ND	ug/l	VARIES	ALL ND EXCEPT THOSE BELOW PER METHOD 8010/8020 - GC
2-4051	-	2831	47572	BLDG. 45-B	BLIND DUPLICATE	12-Oct-89	13-Oct-89	TOLUENE	ND	ug/l	1	(Toluene) PER METHOD 8010/8020 - GC
2-4008	-	2831	47573	BLDG. 45-A	FIELD RINSE BLANK	12-Oct-89	17-Oct-89	SILVER	ND	mg/l	0.02	
2-4008	-	2831	47573	BLDG. 45-A	FIELD RINSE BLANK	12-Oct-89	19-Oct-89	ARSENIC	ND	mg/l	0.005	
2-4008	-	2831	47573	BLDG. 45-A	FIELD RINSE BLANK	12-Oct-89	18-Oct-89	BARIUM	ND	mg/l	0.2	
2-4008	-	2831	47573	BLDG. 45-A	FIELD RINSE BLANK	12-Oct-89	18-Oct-89	CADMIUM	ND	mg/l	0.02	
2-4008	-	2831	47573	BLDG. 45-A	FIELD RINSE BLANK	12-Oct-89	18-Oct-89	CHROMIUM	ND	mg/l	0.05	
2-4008	-	2831	47573	BLDG. 45-A	FIELD RINSE BLANK	12-Oct-89	13-Oct-89	MERCURY	ND	mg/l	0.005	
2-4008	-	2831	47573	BLDG. 45-A	FIELD RINSE BLANK	12-Oct-89	16-Oct-89	LEAD	0.12	mg/l	0.1	
2-4008	-	2831	47573	BLDG. 45-A	FIELD RINSE BLANK	12-Oct-89	19-Oct-89	SELENIUM	ND	mg/l	0.005	
2-4009	-	2831	47574	BLDG. 45-A	FIRST RINSE	12-Oct-89	17-Oct-89	SILVER	ND	mg/l	0.02	
2-4009	-	2831	47574	BLDG. 45-A	FIRST RINSE	12-Oct-89	19-Oct-89	ARSENIC	0.036	mg/l	0.005	
2-4009	-	2831	47574	BLDG. 45-A	FIRST RINSE	12-Oct-89	18-Oct-89	BARIUM	0.56	mg/l	0.2	
2-4009	-	2831	47574	BLDG. 45-A	FIRST RINSE	12-Oct-89	18-Oct-89	CADMIUM	0.06	mg/l	0.02	
2-4009	-	2831	47574	BLDG. 45-A	FIRST RINSE	12-Oct-89	18-Oct-89	CHROMIUM	0.23	mg/l	0.05	
2-4009	-	2831	47574	BLDG. 45-A	FIRST RINSE	12-Oct-89	13-Oct-89	MERCURY	ND	mg/l	0.005	
2-4009	-	2831	47574	BLDG. 45-A	FIRST RINSE	12-Oct-89	16-Oct-89	LEAD	37	mg/l	2	
2-4009	-	2831	47574	BLDG. 45-A	FIRST RINSE	12-Oct-89	19-Oct-89	SELENIUM	ND	mg/l	0.005	
2-4010	-	2831	47575	BLDG. 45-A	SECOND RINSE	12-Oct-89	17-Oct-89	SILVER	ND	mg/l	0.02	
2-4010	-	2831	47575	BLDG. 45-A	SECOND RINSE	12-Oct-89	19-Oct-89	ARSENIC	0.04	mg/l	0.005	
2-4010	-	2831	47575	BLDG. 45-A	SECOND RINSE	12-Oct-89	18-Oct-89	BARIUM	0.6	mg/l	0.2	
2-4010	-	2831	47575	BLDG. 45-A	SECOND RINSE	12-Oct-89	18-Oct-89	CADMIUM	0.06	mg/l	0.02	
2-4010	-	2831	47575	BLDG. 45-A	SECOND RINSE	12-Oct-89	18-Oct-89	CHROMIUM	0.2	mg/l	0.05	
2-4010	-	2831	47575	BLDG. 45-A	SECOND RINSE	12-Oct-89	13-Oct-89	MERCURY	ND	mg/l	0.005	
2-4010	-	2831	47575	BLDG. 45-A	SECOND RINSE	12-Oct-89	16-Oct-89	LEAD	30	mg/l	2	
2-4010	-	2831	47575	BLDG. 45-A	SECOND RINSE	12-Oct-89	19-Oct-89	SELENIUM	ND	mg/l	0.005	
2-4011	-	2831	47576	BLDG. 45-A	THIRD RINSE	12-Oct-89	17-Oct-89	SILVER	ND	mg/l	0.02	
2-4011	-	2831	47576	BLDG. 45-A	THIRD RINSE	12-Oct-89	19-Oct-89	ARSENIC	0.012	mg/l	0.005	
2-4011	-	2831	47576	BLDG. 45-A	THIRD RINSE	12-Oct-89	18-Oct-89	BARIUM	ND	mg/l	0.2	
2-4011	-	2831	47576	BLDG. 45-A	THIRD RINSE	12-Oct-89	18-Oct-89	CADMIUM	0.02	mg/l	0.02	
2-4011	-	2831	47576	BLDG. 45-A	THIRD RINSE	12-Oct-89	18-Oct-89	CHROMIUM	0.06	mg/l	0.05	
2-4011	-	2831	47576	BLDG. 45-A	THIRD RINSE	12-Oct-89	13-Oct-89	MERCURY	ND	mg/l	0.005	
2-4011	-	2831	47576	BLDG. 45-A	THIRD RINSE	12-Oct-89	16-Oct-89	LEAD	11	mg/l	2	
2-4011	-	2831	47576	BLDG. 45-A	THIRD RINSE	12-Oct-89	19-Oct-89	SELENIUM	ND	mg/l	0.005	
2-4052	-	2831	47577	BLDG. 45-A	BLIND DUPLICATE	12-Oct-89	17-Oct-89	SILVER	ND	mg/l	0.02	
2-4052	-	2831	47577	BLDG. 45-A	BLIND DUPLICATE	12-Oct-89	19-Oct-89	ARSENIC	0.013	mg/l	0.005	
2-4052	-	2831	47577	BLDG. 45-A	BLIND DUPLICATE	12-Oct-89	18-Oct-89	BARIUM	ND	mg/l	0.2	
2-4052	-	2831	47577	BLDG. 45-A	BLIND DUPLICATE	12-Oct-89	18-Oct-89	CADMIUM	0.02	mg/l	0.02	
2-4052	-	2831	47577	BLDG. 45-A	BLIND DUPLICATE	12-Oct-89	18-Oct-89	CHROMIUM	0.06	mg/l	0.05	
2-4052	-	2831	47577	BLDG. 45-A	BLIND DUPLICATE	12-Oct-89	13-Oct-89	MERCURY	ND	mg/l	0.005	
2-4052	-	2831	47577	BLDG. 45-A	BLIND DUPLICATE	12-Oct-89	16-Oct-89	LEAD	11	mg/l	2	
2-4052	-	2831	47577	BLDG. 45-A	BLIND DUPLICATE	12-Oct-89	19-Oct-89	SELENIUM	ND	mg/l	0.005	
2-4012	-	2831	47578	BLDG. 45-A	FIELD RINSE BLANK	12-Oct-89	13-Oct-89	VOLATILES	ND	ug/l	VARIES	NO VOLATILES DETECTED PER METHOD 8010/8020 - GC
2-4013	-	2831	47579	BLDG. 45-A	FIRST RINSE	12-Oct-89	13-Oct-89	VOLATILES	ND	ug/l	VARIES	ALL ND EXCEPT THOSE BELOW PER METHOD 8010/8020 - GC
2-4013	-	2831	47579	BLDG. 45-A	FIRST RINSE	12-Oct-89	13-Oct-89	BENZENE	3	ug/l	1	(Benzene) PER METHOD 8010/8020 - GC
2-4013	-	2831	47579	BLDG. 45-A	FIRST RINSE	12-Oct-89	13-Oct-89	TOLUENE	1.8	ug/l	1	(Toluene) PER METHOD 8010/8020 - GC
2-4014	-	2831	47580	BLDG. 45-A	SECOND RINSE	12-Oct-89	13-Oct-89	VOLATILES	ND	ug/l	VARIES	ALL ND EXCEPT THOSE BELOW PER METHOD 8010/8020 - GC
2-4014	-	2831	47580	BLDG. 45-A	SECOND RINSE	12-Oct-89	13-Oct-89	BENZENE	ND	ug/l	1	(Benzene) PER METHOD 8010/8020 - GC

# TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S #	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
2-4014	-	2831	47580	BLDG. 45-A	SECOND RINSE	12-Oct-89	13-Oct-89	TOLUENE	1	ug/l	1	(Toluene) PER METHOD 8010/8020 - GC
2-4015	-	2831	47581	BLDG. 45-A	THIRD RINSE	12-Oct-89	13-Oct-89	VOLATILES	ND	ug/l	VARIES	ALL ND EXCEPT THOSE BELOW PER METHOD 8010/8020 - GC
2-4015	-	2831	47581	BLDG. 45-A	THIRD RINSE	12-Oct-89	13-Oct-89	BENZENE	2.4	ug/l	1	(Benzene) PER METHOD 8010/8020 - GC
2-4015	-	2831	47581	BLDG. 45-A	THIRD RINSE	12-Oct-89	13-Oct-89	TOLUENE	1	ug/l	1	(Toluene) PER METHOD 8010/8020 - GC
2-4053	-	2831	47582	BLDG. 45-A	BLIND DUPLICATE	12-Oct-89	16-Oct-89	VOLATILES	ND	ug/l	VARIES	ALL ND EXCEPT THOSE BELOW PER METHOD 8010/8020 - GC
2-4053	-	2831	47582	BLDG. 45-A	BLIND DUPLICATE	12-Oct-89	16-Oct-89	BENZENE	ND	ug/l	1	(Benzene) PER METHOD 8010/8020 - GC
2-4053	-	2831	47582	BLDG. 45-A	BLIND DUPLICATE	12-Oct-89	16-Oct-89	TOLUENE	1.2	ug/l	1	(Toluene) PER METHOD 8010/8020 - GC
-	-	2831	47583	BLDG. 45-A	TRIP BLANK	12-Oct-89	16-Oct-89	VOLATILES	ND	ug/l	VARIES	NO VOLATILES DETECTED PER METHOD 8010/8020 - GC
2-4016	WB-1	2877	47865	DOCK 2-B	WOOD BLOCK	17-Oct-89	19-Oct-89	VOLATILES	ND	mg/kg	VARIES	NO VOLATILES PER METHODS 8010/8015/8020 - GC
2-4016	WB-1	2877	47865	DOCK 2-B	WOOD BLOCK	17-Oct-89	22-Oct-89	DIOXANE	ND	mg/kg	500	
2-4017	WB-2	2877	47866	DOCK 2-B	WOOD BLOCK	17-Oct-89	19-Oct-89	VOLATILES	ND	mg/kg	VARIES	NO VOLATILES PER METHODS 8010/8015/8020 - GC
2-4017	WB-2	2877	47866	DOCK 2-B	WOOD BLOCK	17-Oct-89	22-Oct-89	DIOXANE	ND	mg/kg	500	
2-4018	WB-3	2877	47867	DOCK 2-B	WOOD BLOCK	17-Oct-89	19-Oct-89	VOLATILES	ND	mg/kg	VARIES	NO VOLATILES PER METHODS 8010/8015/8020 - GC
2-4018	WB-3	2877	47867	DOCK 2-B	WOOD BLOCK	17-Oct-89	22-Oct-89	DIOXANE	ND	mg/kg	500	
2-4019	WB-4	2877	47868	DOCK 2-B	WOOD BLOCK	17-Oct-89	19-Oct-89	VOLATILES	ND	mg/kg	VARIES	NO VOLATILES PER METHODS 8010/8015/8020 - GC
2-4019	WB-4	2877	47868	DOCK 2-B	WOOD BLOCK	17-Oct-89	22-Oct-89	DIOXANE	ND	mg/kg	500	
2-4020	WB-5	2877	47869	DOCK 2-B	WOOD BLOCK	17-Oct-89	19-Oct-89	VOLATILES	ND	mg/kg	VARIES	NO VOLATILES PER METHODS 8010/8015/8020 - GC
2-4020	WB-5	2877	47869	DOCK 2-B	WOOD BLOCK	17-Oct-89	22-Oct-89	DIOXANE	ND	mg/kg	500	
2-4021	WB-6	2877	47870	DOCK 2-B	WOOD BLOCK	17-Oct-89	19-Oct-89	VOLATILES	ND	mg/kg	VARIES	NO VOLATILES PER METHODS 8010/8015/8020 - GC
2-4021	WB-6	2877	47870	DOCK 2-B	WOOD BLOCK	17-Oct-89	22-Oct-89	DIOXANE	ND	mg/kg	500	
2-4022	WB-7	2877	47871	DOCK 2-B	WOOD BLOCK	17-Oct-89	19-Oct-89	VOLATILES	ND	mg/kg	VARIES	NO VOLATILES PER METHODS 8010/8015/8020 - GC
2-4022	WB-7	2877	47871	DOCK 2-B	WOOD BLOCK	17-Oct-89	22-Oct-89	DIOXANE	ND	mg/kg	500	
2-4023	WB-8	2877	47872	DOCK 2-B	WOOD BLOCK	17-Oct-89	19-Oct-89	VOLATILES	ND	mg/kg	VARIES	NO VOLATILES PER METHODS 8010/8015/8020 - GC
2-4023	WB-8	2877	47872	DOCK 2-B	WOOD BLOCK	17-Oct-89	22-Oct-89	DIOXANE	ND	mg/kg	500	
2-4024	E-13	2877	47873	HOLDING TANKS	FINAL RINSE MID. TANK BOT	17-Oct-89	18-Oct-89	PGDN	ND	mg/l	0.2	DETECTION LIMITS & UNITS CORRECTED 11/13/89
2-4025	E-14	2877	47874	HOLDING TANKS	FINAL RINSE S. TANK BOT	17-Oct-89	18-Oct-89	PGDN	ND	mg/l	0.2	DETECTION LIMITS & UNITS CORRECTED 11/13/89
2-4026	E-15	2877	47875	HOLDING TANKS	FINAL RINSE TANK TOPS	17-Oct-89	18-Oct-89	PGDN	ND	mg/l	0.2	DETECTION LIMITS & UNITS CORRECTED 11/13/89
2-4027	IP-1	2895	47936	INLET PIPE	SHELBY TUBE SOIL SAMPLE	18-Oct-89	20-Oct-89	PGDN	ND	mg/kg	20	
2-4027	IP-1	2895	47936	INLET PIPE	SHELBY TUBE SOIL SAMPLE	18-Oct-89	20-Oct-89	CYANIDE	0.1	mg/kg	0.1	
2-4028	IP-2	2895	47937	INLET PIPE	SHELBY TUBE SOIL SAMPLE	18-Oct-89	20-Oct-89	PGDN	ND	mg/kg	20	
2-4028	IP-2	2895	47937	INLET PIPE	SHELBY TUBE SOIL SAMPLE	18-Oct-89	20-Oct-89	CYANIDE	0.3	mg/kg	0.1	
2-4029	IP-3	2895	47938	INLET PIPE	SHELBY TUBE SOIL SAMPLE	18-Oct-89	20-Oct-89	PGDN	ND	mg/kg	20	
2-4029	IP-3	2895	47938	INLET PIPE	SHELBY TUBE SOIL SAMPLE	18-Oct-89	20-Oct-89	CYANIDE	0.3	mg/kg	0.1	
2-4030	IP-4	2895	47939	INLET PIPE	SHELBY TUBE SOIL SAMPLE	18-Oct-89	20-Oct-89	PGDN	ND	mg/kg	20	
2-4030	IP-4	2895	47939	INLET PIPE	SHELBY TUBE SOIL SAMPLE	18-Oct-89	20-Oct-89	CYANIDE	0.2	mg/kg	0.1	
2-4031	-	2917	48031	FRAC TANK #2	WATER SAMPLE	20-Oct-89	26-Oct-89	PGDN	0.4	mg/l	0.2	
2-4032	-	2917	48032	FRAC TANK #2	WATER SAMPLE	20-Oct-89	25-Oct-89	CYANIDE	ND	mg/l	10	
2-4033	-	2917	48033	FRAC TANK #2	WATER SAMPLE	20-Oct-89	25-Oct-89	AM. Cn	ND	mg/l	2	
2-4034	-	2917	48034	FRAC TANK #2	WATER SAMPLE	20-Oct-89	27-Oct-89	SILVER	ND	mg/l	0.02	
2-4034	-	2917	48034	FRAC TANK #2	WATER SAMPLE	20-Oct-89	27-Oct-89	ARSENIC	ND	mg/l	0.005	
2-4034	-	2917	48034	FRAC TANK #2	WATER SAMPLE	20-Oct-89	27-Oct-89	BARIUM	ND	mg/l	0.2	
2-4034	-	2917	48034	FRAC TANK #2	WATER SAMPLE	20-Oct-89	27-Oct-89	CADMIUM	ND	mg/l	0.01	
2-4034	-	2917	48034	FRAC TANK #2	WATER SAMPLE	20-Oct-89	27-Oct-89	CHROMIUM	ND	mg/l	0.05	
2-4034	-	2917	48034	FRAC TANK #2	WATER SAMPLE	20-Oct-89	27-Oct-89	COPPER	ND	mg/l	0.2	
2-4034	-	2917	48034	FRAC TANK #2	WATER SAMPLE	20-Oct-89	27-Oct-89	MERCURY	ND	mg/l	0.002	
2-4034	-	2917	48034	FRAC TANK #2	WATER SAMPLE	20-Oct-89	27-Oct-89	NICKEL	ND	mg/l	0.1	
2-4034	-	2917	48034	FRAC TANK #2	WATER SAMPLE	20-Oct-89	27-Oct-89	LEAD	ND	mg/l	0.05	
2-4034	-	2917	48034	FRAC TANK #2	WATER SAMPLE	20-Oct-89	27-Oct-89	SELENIUM	ND	mg/l	0.005	
2-4034	-	2917	48034	FRAC TANK #2	WATER SAMPLE	20-Oct-89	27-Oct-89	ZINC	ND	mg/l	0.05	

# TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S #	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
2-4035	HT-3	2954	48190	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	24-Oct-89	28-Oct-89	PGDN	ND	mg/kg	20	RE-RAN EXTRACT ON NEW COLUMN 11/3, LOWERED LDL TO 20
2-4035	HT-3	2954	48190	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	24-Oct-89	28-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4036	HT-4	2954	48191	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	24-Oct-89	28-Oct-89	PGDN	ND	mg/kg	20	RE-RAN EXTRACT ON NEW COLUMN 11/3, LOWERED LDL TO 20
2-4036	HT-4	2954	48191	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	24-Oct-89	28-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4037	E-16	2954	48192	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	24-Oct-89	28-Oct-89	PGDN	ND	mg/kg	20	RE-RAN EXTRACT ON NEW COLUMN 11/3, LOWERED LDL TO 20
2-4037	E-16	2954	48192	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	24-Oct-89	28-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4038	E-17	2954	48193	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	24-Oct-89	28-Oct-89	PGDN	ND	mg/kg	20	RE-RAN EXTRACT ON NEW COLUMN 11/3, LOWERED LDL TO 20
2-4038	E-17	2954	48193	HOLDING TANKS	SHELBY TUBE SOIL SAMPLE	24-Oct-89	28-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4039	E-18	2955	48233	RAW FUEL PIPE	SHELBY TUBE SOIL SAMPLE	24-Oct-89	31-Oct-89	PGDN	ND	mg/kg	20	RE-RAN EXTRACT ON NEW COLUMN 11/3, LOWERED LDL TO 20
2-4039	E-18	2955	48233	RAW FUEL PIPE	SHELBY TUBE SOIL SAMPLE	24-Oct-89	31-Oct-89	CYANIDE	0.4	mg/kg	0.1	
2-4040	E-19	2955	48234	RAW FUEL PIPE	SHELBY TUBE SOIL SAMPLE	24-Oct-89	31-Oct-89	PGDN	ND	mg/kg	20	RE-RAN EXTRACT ON NEW COLUMN 11/3, LOWERED LDL TO 20
2-4040	E-19	2955	48234	RAW FUEL PIPE	SHELBY TUBE SOIL SAMPLE	24-Oct-89	31-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4041	E-20	2955	48235	RAW FUEL PIPE	SHELBY TUBE SOIL SAMPLE	24-Oct-89	31-Oct-89	PGDN	ND	mg/kg	20	RE-RAN EXTRACT ON NEW COLUMN 11/3, LOWERED LDL TO 20
2-4041	E-20	2955	48235	RAW FUEL PIPE	SHELBY TUBE SOIL SAMPLE	24-Oct-89	31-Oct-89	CYANIDE	ND	mg/kg	0.1	
2-4042	E-21	2955	48236	RAW FUEL PIPE	SHELBY TUBE SOIL SAMPLE	24-Oct-89	31-Oct-89	PGDN	ND	mg/kg	20	RE-RAN EXTRACT ON NEW COLUMN 11/3, LOWERED LDL TO 20
2-4042	E-21	2955	48236	RAW FUEL PIPE	SHELBY TUBE SOIL SAMPLE	24-Oct-89	31-Oct-89	CYANIDE	1.5	mg/kg	0.1	
2-4054	-	2955	48237	RAW FUEL PIPE	SHELBY TUBE SOIL SAMPLE	24-Oct-89	31-Oct-89	PGDN	ND	mg/kg	20	BLIND DUPLICATE #5, TAKEN AT E-19, ALSO LOWERED LDL
2-4054	-	2955	48237	RAW FUEL PIPE	SHELBY TUBE SOIL SAMPLE	24-Oct-89	31-Oct-89	CYANIDE	ND	mg/kg	0.1	BLIND DUPLICATE #5, TAKEN AT E-19
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	10-Nov-89	@RIGHT	ND	mg/kg	VARIES	8-PCB'S ON USEPA TARGET COMPOUND LIST ALL ND
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	10-Nov-89	@RIGHT	ND	mg/kg	VARIES	10-PESTICIDES ON USEPA TARGET COMPOUND LIST ALL ND
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	09-Nov-89	@RIGHT	ND	mg/kg	VARIES	11-ACID EX ORG ON USEPA TARGET COMPOUND LIST ALL ND
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	09-Nov-89	@RIGHT	ND	mg/kg	VARIES	45-B/N EX ORG ON USEPA T.C.L. ALL ND EXCEPT BELOW
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	09-Nov-89	@RIGHT	0.4 JB	mg/kg	1	Di-n-butyl phthalate DET BELOW QUANT LMT & IN BLANK
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	09-Nov-89	@RIGHT	0.1 J	mg/kg	1	Fluoranthene DETECTED BUT BELOW QUANTITATION LIMIT
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	09-Nov-89	@RIGHT	0.1 J	mg/kg	1	Pyrene DETECTED BUT BELOW QUANTITATION LIMIT
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	14-Nov-89	@RIGHT	ND	mg/kg	VARIES	33-VOL ORGANIC ON USEPA TARGET COMPOUND LIST ALL ND
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	29-Nov-89	Ag	ND	mg/kg	2	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	24-Nov-89	Al	1400	mg/kg	50	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	24-Nov-89	As	4.5	mg/kg	0.5	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	29-Nov-89	Ba	ND	mg/kg	20	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	29-Nov-89	Be	ND	mg/kg	1	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	29-Nov-89	Ce	1.9	%	0.5	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	28-Nov-89	Cd	ND	mg/kg	2	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	28-Nov-89	Co	11	mg/kg	5	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	29-Nov-89	Cr	ND	mg/kg	5	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	22-Nov-89	Cu	11	mg/kg	2	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	28-Nov-89	Fe	6500	mg/kg	50	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	29-Nov-89	Hg	ND	mg/kg	0.5	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	28-Nov-89	K	150	mg/kg	10	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	28-Nov-89	Mg	2900	mg/kg	200	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	28-Nov-89	Mn	200	mg/kg	20	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	29-Nov-89	Na	95	mg/kg	10	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	28-Nov-89	Ni	18	mg/kg	10	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	21-Nov-89	Pb	ND	mg/kg	10	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	29-Nov-89	Sb	ND	mg/kg	50	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	27-Nov-89	Se	ND	mg/kg	0.5	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	29-Nov-89	Ti	ND	mg/kg	10	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	29-Nov-89	V	ND	mg/kg	100	
2-4043	E-22	3083	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-89	28-Nov-89	Zn	31	mg/kg	1	

## TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S #	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
2-4043	E-22	3003	48807	KURTZ BROS.	BORROW MATERIAL	02-Nov-80	08-Nov-80	CYANIDE	ND	mg/kg	0.1	
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	13-Nov-80	@RIGHT	ND	mg/kg	VARIES	8-PCB'S, ALL NON-DETECT
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	14-Nov-80	@RIGHT	ND	ug/l	VARIES	4-CHLORINATED PESTICIDES PER 40CFR-261.2, ALL ND
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	15-Nov-80	@RIGHT	ND	ug/l	VARIES	2-HERBICIDES PER 40CFR-261.2, ALL ND
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	09-Nov-80	SILVER	0.04	mg/l	0.02	EP-TOX METALS PER 40CFR-261.2
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	08-Nov-80	ARSENIC	ND	mg/l	0.005	EP-TOX METALS PER 40CFR-261.2
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	08-Nov-80	BARIUM	1.1	mg/l	0.2	EP-TOX METALS PER 40CFR-261.2
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	09-Nov-80	CADMIUM	ND	mg/l	0.02	EP-TOX METALS PER 40CFR-261.2
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	09-Nov-80	CHROMIUM	ND	mg/l	0.05	EP-TOX METALS PER 40CFR-261.2
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	09-Nov-80	MERCURY	ND	mg/l	0.005	EP-TOX METALS PER 40CFR-261.2
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	08-Nov-80	LEAD	ND	mg/l	0.1	EP-TOX METALS PER 40CFR-261.2
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	09-Nov-80	SELENIUM	0.04	mg/l	0.005	EP-TOX METALS PER 40CFR-261.2
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	20-Nov-80	FLASH PT.	>210	DEG. F.	-	IGNITABILITY PER 40CFR-261.2
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	08-Nov-80	pH	11.7	S.U.	-	CORROSIVITY PER 40CFR-261.2
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	08-Nov-80	CYANIDE	0.9	mg/kg	0.1	REACTIVITY PER 40CFR-261.2
2-4044	E-23	3003	48808	HOLDING TANKS	CONCRETE TANK TOPS	02-Nov-80	05-Nov-80	SULFIDE	30	mg/kg	10	REACTIVITY PER 40CFR-261.2
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	13-Nov-80	@RIGHT	ND	mg/kg	VARIES	8-PCB'S, ALL NON-DETECT
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	14-Nov-80	@RIGHT	ND	ug/l	VARIES	4-CHLORINATED PESTICIDES PER 40CFR-261.2, ALL ND
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	15-Nov-80	@RIGHT	ND	ug/l	VARIES	2-HERBICIDES PER 40CFR-261.2, ALL ND
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	09-Nov-80	SILVER	0.04	mg/l	0.02	EP-TOX METALS PER 40CFR-261.2
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	08-Nov-80	ARSENIC	ND	mg/l	0.005	EP-TOX METALS PER 40CFR-261.2
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	08-Nov-80	BARIUM	1.2	mg/l	0.2	EP-TOX METALS PER 40CFR-261.2
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	09-Nov-80	CADMIUM	ND	mg/l	0.02	EP-TOX METALS PER 40CFR-261.2
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	09-Nov-80	CHROMIUM	ND	mg/l	0.05	EP-TOX METALS PER 40CFR-261.2
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	09-Nov-80	MERCURY	ND	mg/l	0.005	EP-TOX METALS PER 40CFR-261.2
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	09-Nov-80	LEAD	ND	mg/l	0.1	EP-TOX METALS PER 40CFR-261.2
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	09-Nov-80	SELENIUM	0.038	mg/l	0.005	EP-TOX METALS PER 40CFR-261.2
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	20-Nov-80	FLASH PT.	>210	DEG. F.	-	IGNITABILITY PER 40CFR-261.2
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	05-Nov-80	pH	11.9	S.U.	-	CORROSIVITY PER 40CFR-261.2
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	08-Nov-80	CYANIDE	0.9	mg/kg	0.1	REACTIVITY PER 40CFR-261.2
2-4045	E-24	3003	48809	HOLDING TANKS	CONCRETE TANK BOTTOMS	02-Nov-80	05-Nov-80	SULFIDE	20	mg/kg	10	REACTIVITY PER 40CFR-261.2
2-4046	E-25	3003	48810	BLDG. 40	CONC. WALL-EAST TEST CELL	02-Nov-80	08-Nov-80	PGDN	24	mg/kg	20	YELLOW STAINED CONCRETE-POTENTIAL PGDN STAINED
2-4046	E-25	3003	48810	BLDG. 40	CONC. WALL-EAST TEST CELL	02-Nov-80	08-Nov-80	CYANIDE	ND	mg/kg	0.1	YELLOW STAINED CONCRETE-POTENTIAL PGDN STAINED
2-4047	-	-	-	BLDG. 40	EAST TEST CELL RINSE	13-Nov-80	-	PGDN				VOIDED AND RE-SAMPLED ON 11/14/80
2-4048	-	-	-	BLDG. 40	EAST TEST CELL RINSE	13-Nov-80	-	CYANIDE				VOIDED AND RE-SAMPLED ON 11/14/80
2-4049	-	-	-	BLDG. 40	WEST TEST CELL RINSE	13-Nov-80	-	PGDN				VOIDED AND RE-SAMPLED ON 11/14/80
2-4050	-	-	-	BLDG. 40	WEST TEST CELL RINSE	13-Nov-80	-	CYANIDE				VOIDED AND RE-SAMPLED ON 11/14/80
2-4056	E-26	3236	49325	BLDG. 40	EAST TEST CELL RINSE	14-Nov-80	16-Nov-80	PGDN	ND	mg/l	0.1	
2-4057	E-26	3236	49326	BLDG. 40	EAST TEST CELL RINSE	14-Nov-80	16-Nov-80	CYANIDE	ND	mg/l	0.01	
2-4058	E-27	3236	49327	BLDG. 40	WEST TEST CELL RINSE	14-Nov-80	16-Nov-80	PGDN	ND	mg/l	0.1	
2-4059	E-27	3236	49328	BLDG. 40	WEST TEST CELL RINSE	14-Nov-80	17-Nov-80	CYANIDE	ND	mg/l	0.01	
2-4060	E-28	3236	49329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	21-Nov-80	FLASH PT.	>210	DEG. F.	-	IGNITABILITY PER 40CFR-261.2
2-4060	E-28	3236	49329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	15-Nov-80	pH	11.8	S.U.	-	CORROSIVITY PER 40CFR-261.2
2-4060	E-28	3236	49329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	17-Nov-80	CYANIDE	ND	mg/kg	0.1	REACTIVITY PER 40CFR-261.2
2-4060	E-28	3236	49329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	20-Nov-80	SULFIDE	ND	mg/kg	10	REACTIVITY PER 40CFR-261.2
2-4060	E-28	3236	49329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	28-Nov-80	SILVER	0.03	mg/l	0.02	EP-TOX METALS PER 40CFR-261.2

# TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S #	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
2-4060	E-28	3236	40329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	20-Nov-80	ARSENIC	ND	mg/l	0.005	EP-TOX METALS PER 40CFR-261.2
2-4060	E-28	3236	40329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	28-Nov-80	BARIIUM	1.3	mg/l	0.2	EP-TOX METALS PER 40CFR-261.2
2-4060	E-28	3236	40329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	28-Nov-80	CADMIUM	0.07	mg/l	0.02	EP-TOX METALS PER 40CFR-261.2
2-4060	E-28	3236	40329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	24-Nov-80	CHROMIUM	ND	mg/l	0.05	EP-TOX METALS PER 40CFR-261.2
2-4060	E-28	3236	40329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	21-Nov-80	MERCURY	ND	mg/l	0.005	EP-TOX METALS PER 40CFR-261.2
2-4060	E-28	3236	40329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	21-Nov-80	LEAD	ND	mg/l	0.1	EP-TOX METALS PER 40CFR-261.2
2-4060	E-28	3236	40329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	20-Nov-80	SELENIUM	ND	mg/l	0.005	EP-TOX METALS PER 40CFR-261.2
2-4060	E-28	3236	40329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	21-Nov-80	PHOSPHORUS	ND	mg/kg	VARIES	PESTICIDES ALL NON-DETECT
2-4060	E-28	3236	40329	BLDG. 40	COMPOSITE CONCRETE	14-Nov-80	22-Nov-80	PHOSPHORUS	ND	mg/kg	VARIES	HERBICIDES ALL NON-DETECT
2-1402	-	3327	40661	FRAC TANK #2	WATER SAMPLE	20-Nov-80	27-Nov-80	PODN	ND	mg/l	0.1	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1403	-	3327	40662	FRAC TANK #2	WATER SAMPLE	20-Nov-80	22-Nov-80	CYANIDE	0.09	mg/l	777	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1404	-	3327	40663	FRAC TANK #2	WATER SAMPLE	20-Nov-80	27-Nov-80	AM. Cn	0.06	mg/l	777	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1405	-	3327	40664	FRAC TANK #2	WATER SAMPLE	20-Nov-80	24-Nov-80	SILVER	ND	mg/l	0.01	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1405	-	3327	40664	FRAC TANK #2	WATER SAMPLE	20-Nov-80	24-Nov-80	ARSENIC	ND	mg/l	0.005	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1405	-	3327	40664	FRAC TANK #2	WATER SAMPLE	20-Nov-80	24-Nov-80	BARIIUM	0.06	mg/l	0.01	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1405	-	3327	40664	FRAC TANK #2	WATER SAMPLE	20-Nov-80	24-Nov-80	CADMIUM	ND	mg/l	0.01	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1405	-	3327	40664	FRAC TANK #2	WATER SAMPLE	20-Nov-80	24-Nov-80	CHROMIUM	ND	mg/l	0.02	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1405	-	3327	40664	FRAC TANK #2	WATER SAMPLE	20-Nov-80	24-Nov-80	COPPER	ND	mg/l	0.01	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1405	-	3327	40664	FRAC TANK #2	WATER SAMPLE	20-Nov-80	24-Nov-80	MERCURY	ND	mg/l	0.002	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1405	-	3327	40664	FRAC TANK #2	WATER SAMPLE	20-Nov-80	24-Nov-80	NICKEL	ND	mg/l	0.04	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1405	-	3327	40664	FRAC TANK #2	WATER SAMPLE	20-Nov-80	24-Nov-80	LEAD	ND	mg/l	0.05	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1405	-	3327	40664	FRAC TANK #2	WATER SAMPLE	20-Nov-80	25-Nov-80	SELENIUM	ND	mg/l	0.005	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1405	-	3327	40664	FRAC TANK #2	WATER SAMPLE	20-Nov-80	24-Nov-80	ZINC	0.06	mg/l	0.01	WATER FROM FRAC TANK #1 AFTER CARBON TREATMENT
2-1406	-	3327	40665	DOCK 2-B	TAP WATER BLANK	20-Nov-80	24-Nov-80	CADMIUM	ND	mg/l	0.002	NEW HOT WATER SOURCE
2-1406	-	3327	40665	DOCK 2-B	TAP WATER BLANK	20-Nov-80	24-Nov-80	CHROMIUM	ND	mg/l	0.01	NEW HOT WATER SOURCE
2-1406	-	3327	40665	DOCK 2-B	TAP WATER BLANK	20-Nov-80	30-Nov-80	MERCURY	ND	mg/l	0.002	NEW HOT WATER SOURCE
2-1406	-	3327	40665	DOCK 2-B	TAP WATER BLANK	20-Nov-80	24-Nov-80	LEAD	ND	mg/l	0.01	NEW HOT WATER SOURCE
2-1407	-	3327	40666	DOCK 2-B	FIELD RINSE BLANK	20-Nov-80	24-Nov-80	CADMIUM	ND	mg/l	0.002	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1407	-	3327	40666	DOCK 2-B	FIELD RINSE BLANK	20-Nov-80	24-Nov-80	CHROMIUM	ND	mg/l	0.01	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1407	-	3327	40666	DOCK 2-B	FIELD RINSE BLANK	20-Nov-80	30-Nov-80	MERCURY	ND	mg/l	0.002	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1407	-	3327	40666	DOCK 2-B	FIELD RINSE BLANK	20-Nov-80	24-Nov-80	LEAD	ND	mg/l	0.01	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1408	-	3327	40667	DOCK 2-B	FINAL RINSE	20-Nov-80	24-Nov-80	CADMIUM	0.005	mg/l	0.002	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1408	-	3327	40667	DOCK 2-B	FINAL RINSE	20-Nov-80	24-Nov-80	CHROMIUM	0.006	mg/l	0.01	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1408	-	3327	40667	DOCK 2-B	FINAL RINSE	20-Nov-80	30-Nov-80	MERCURY	ND	mg/l	0.002	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1408	-	3327	40667	DOCK 2-B	FINAL RINSE	20-Nov-80	24-Nov-80	LEAD	0.27	mg/l	0.01	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-3870	-	3327	40668	DOCK 2-B	BLIND DUPLICATE	20-Nov-80	24-Nov-80	CADMIUM	0.005	mg/l	0.002	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-3870	-	3327	40668	DOCK 2-B	BLIND DUPLICATE	20-Nov-80	24-Nov-80	CHROMIUM	0.003	mg/l	0.01	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-3870	-	3327	40668	DOCK 2-B	BLIND DUPLICATE	20-Nov-80	30-Nov-80	MERCURY	ND	mg/l	0.002	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-3870	-	3327	40668	DOCK 2-B	BLIND DUPLICATE	20-Nov-80	24-Nov-80	LEAD	0.24	mg/l	0.01	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1409	-	3361	40791	BLDG. 45	TAP WATER BLANK	22-Nov-80	29-Nov-80	CADMIUM	ND	mg/l	0.001	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1409	-	3361	40791	BLDG. 45	TAP WATER BLANK	22-Nov-80	29-Nov-80	CHROMIUM	ND	mg/l	0.02	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1409	-	3361	40791	BLDG. 45	TAP WATER BLANK	22-Nov-80	29-Nov-80	LEAD	ND	mg/l	0.005	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1500	-	3361	40792	BLDG. 45-A	FIELD RINSE BLANK	22-Nov-80	29-Nov-80	CADMIUM	ND	mg/l	0.001	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1500	-	3361	40792	BLDG. 45-A	FIELD RINSE BLANK	22-Nov-80	29-Nov-80	CHROMIUM	ND	mg/l	0.02	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1500	-	3361	40792	BLDG. 45-A	FIELD RINSE BLANK	22-Nov-80	30-Nov-80	LEAD	0.27	mg/l	0.06	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1501	-	3361	40793	BLDG. 45-A	FINAL RINSE	22-Nov-80	29-Nov-80	CADMIUM	0.002	mg/l	0.002	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1501	-	3361	40793	BLDG. 45-A	FINAL RINSE	22-Nov-80	29-Nov-80	CHROMIUM	ND	mg/l	0.02	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1501	-	3361	40793	BLDG. 45-A	FINAL RINSE	22-Nov-80	29-Nov-80	LEAD	0.54	mg/l	0.05	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT

# TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S #	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
2-3871	-	3361	48794	BLDG. 45-A	BLIND DUPLICATE	22-Nov-80	29-Nov-80	CADMIUM	0.002	mg/l	0.001	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-3871	-	3361	48794	BLDG. 45-A	BLIND DUPLICATE	22-Nov-80	29-Nov-80	CHROMIUM	ND	mg/l	0.02	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-3871	-	3361	48794	BLDG. 45-A	BLIND DUPLICATE	22-Nov-80	29-Nov-80	LEAD	0.51	mg/l	0.05	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1502	-	3361	48795	BLDG. 45-B	FIELD RINSE BLANK	22-Nov-80	29-Nov-80	CADMIUM	ND	mg/l	0.001	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1502	-	3361	48795	BLDG. 45-B	FIELD RINSE BLANK	22-Nov-80	29-Nov-80	CHROMIUM	ND	mg/l	0.02	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1502	-	3361	48795	BLDG. 45-B	FIELD RINSE BLANK	22-Nov-80	29-Nov-80	LEAD	0.068	mg/l	0.01	PRIOR TO SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1503	-	3361	48796	BLDG. 45-B	FINAL RINSE	22-Nov-80	29-Nov-80	CADMIUM	0.022	mg/l	0.004	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1503	-	3361	48796	BLDG. 45-B	FINAL RINSE	22-Nov-80	29-Nov-80	CHROMIUM	0.085	mg/l	0.02	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1503	-	3361	48796	BLDG. 45-B	FINAL RINSE	22-Nov-80	29-Nov-80	LEAD	0.33	mg/l	0.05	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-4973	-	3361	48797	BLDG. 45-B	BLIND DUPLICATE	22-Nov-80	29-Nov-80	CADMIUM	0.022	mg/l	0.004	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-4973	-	3361	48797	BLDG. 45-B	BLIND DUPLICATE	22-Nov-80	29-Nov-80	CHROMIUM	0.086	mg/l	0.02	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-4973	-	3361	48797	BLDG. 45-B	BLIND DUPLICATE	22-Nov-80	29-Nov-80	LEAD	0.3	mg/l	0.05	AFTER SCRUBBING WITH PHOSPHORIC ACID DETERGENT
2-1504	E-29	3489	50346	BLDG. 40	TEST CELL EQUIP RINSE	04-Dec-80	07-Dec-80	PGDN	ND	mg/l	0.1	CONTAMINATED EQUIP REMOVED FROM TEST CELLS & ROOF
2-1506	E-29	3489	50347	BLDG. 40	TEST CELL EQUIP RINSE	04-Dec-80	06-Dec-80	CYANIDE	0.02	mg/l	0.01	CONTAMINATED EQUIP REMOVED FROM TEST CELLS & ROOF
2-1506	-	3627	50824	DOCK 2-B	FIELD RINSE BLANK	12-Dec-80	22-Dec-80	CADMIUM	ND	mg/l	0.01	PRIOR TO FURTHER SCRUBBING AND RINSING
2-1506	-	3627	50824	DOCK 2-B	FIELD RINSE BLANK	12-Dec-80	22-Dec-80	CHROMIUM	ND	mg/l	0.02	PRIOR TO FURTHER SCRUBBING AND RINSING
2-1506	-	3627	50824	DOCK 2-B	FIELD RINSE BLANK	12-Dec-80	22-Dec-80	MERCURY	ND	mg/l	0.002	PRIOR TO FURTHER SCRUBBING AND RINSING
2-1506	-	3627	50824	DOCK 2-B	FIELD RINSE BLANK	12-Dec-80	22-Dec-80	LEAD	ND	mg/l	0.005	PRIOR TO FURTHER SCRUBBING AND RINSING
2-1507	-	3627	50825	DOCK 2-B	FINAL RINSE	12-Dec-80	22-Dec-80	CADMIUM	ND	mg/l	0.01	AFTER FURTHER SCRUBBING AND RINSING
2-1507	-	3627	50825	DOCK 2-B	FINAL RINSE	12-Dec-80	22-Dec-80	CHROMIUM	ND	mg/l	0.02	AFTER FURTHER SCRUBBING AND RINSING
2-1507	-	3627	50825	DOCK 2-B	FINAL RINSE	12-Dec-80	22-Dec-80	MERCURY	ND	mg/l	0.002	AFTER FURTHER SCRUBBING AND RINSING
2-1507	-	3627	50825	DOCK 2-B	FINAL RINSE	12-Dec-80	22-Dec-80	LEAD	0.03	mg/l	0.005	AFTER FURTHER SCRUBBING AND RINSING
2-1571	-	3627	50826	DOCK 2-B	BLIND DUPLICATE	12-Dec-80	22-Dec-80	CADMIUM	ND	mg/l	0.01	AFTER FURTHER SCRUBBING AND RINSING
2-1571	-	3627	50826	DOCK 2-B	BLIND DUPLICATE	12-Dec-80	22-Dec-80	CHROMIUM	ND	mg/l	0.02	AFTER FURTHER SCRUBBING AND RINSING
2-1571	-	3627	50826	DOCK 2-B	BLIND DUPLICATE	12-Dec-80	22-Dec-80	MERCURY	ND	mg/l	0.002	AFTER FURTHER SCRUBBING AND RINSING
2-1571	-	3627	50826	DOCK 2-B	BLIND DUPLICATE	12-Dec-80	22-Dec-80	LEAD	0.02	mg/l	0.005	AFTER FURTHER SCRUBBING AND RINSING
2-1508	-	3627	50819	BLDG. 45	TAP WATER BLANK	13-Dec-80	22-Dec-80	CADMIUM	ND	mg/l	0.01	NEW WATER SOURCE FOR HOT WATER
2-1508	-	3627	50819	BLDG. 45	TAP WATER BLANK	13-Dec-80	22-Dec-80	CHROMIUM	ND	mg/l	0.02	NEW WATER SOURCE FOR HOT WATER
2-1508	-	3627	50819	BLDG. 45	TAP WATER BLANK	13-Dec-80	22-Dec-80	LEAD	0.04	mg/l	0.005	NEW WATER SOURCE FOR HOT WATER
2-1509	-	3627	50820	BLDG. 45-B	FIELD RINSE BLANK	13-Dec-80	22-Dec-80	CADMIUM	ND	mg/l	0.01	PRIOR TO FURTHER SCRUBBING AND RINSING
2-1509	-	3627	50820	BLDG. 45-B	FIELD RINSE BLANK	13-Dec-80	22-Dec-80	CHROMIUM	ND	mg/l	0.02	PRIOR TO FURTHER SCRUBBING AND RINSING
2-1509	-	3627	50820	BLDG. 45-B	FIELD RINSE BLANK	13-Dec-80	22-Dec-80	LEAD	ND	mg/l	0.005	PRIOR TO FURTHER SCRUBBING AND RINSING
2-1510	-	3627	50821	BLDG. 45-B	FINAL RINSE	13-Dec-80	22-Dec-80	CADMIUM	0.02	mg/l	0.01	AFTER FURTHER SCRUBBING AND RINSING
2-1510	-	3627	50821	BLDG. 45-B	FINAL RINSE	13-Dec-80	22-Dec-80	CHROMIUM	0.05	mg/l	0.02	AFTER FURTHER SCRUBBING AND RINSING
2-1510	-	3627	50821	BLDG. 45-B	FINAL RINSE	13-Dec-80	22-Dec-80	LEAD	0.32	mg/l	0.005	AFTER FURTHER SCRUBBING AND RINSING
2-1572	-	3627	50822	BLDG. 45-B	BLIND DUPLICATE	13-Dec-80	22-Dec-80	CADMIUM	0.02	mg/l	0.01	AFTER FURTHER SCRUBBING AND RINSING
2-1572	-	3627	50822	BLDG. 45-B	BLIND DUPLICATE	13-Dec-80	22-Dec-80	CHROMIUM	0.05	mg/l	0.02	AFTER FURTHER SCRUBBING AND RINSING
2-1572	-	3627	50822	BLDG. 45-B	BLIND DUPLICATE	13-Dec-80	22-Dec-80	LEAD	0.33	mg/l	0.005	AFTER FURTHER SCRUBBING AND RINSING
2-1511	-	3627	50823	BLDG. 45-A	FIELD RINSE BLANK	13-Dec-80	22-Dec-80	CADMIUM	ND	mg/l	0.01	PRIOR TO FURTHER SCRUBBING AND RINSING
2-1511	-	3627	50823	BLDG. 45-A	FIELD RINSE BLANK	13-Dec-80	22-Dec-80	CHROMIUM	ND	mg/l	0.02	PRIOR TO FURTHER SCRUBBING AND RINSING
2-1511	-	3627	50823	BLDG. 45-A	FIELD RINSE BLANK	13-Dec-80	22-Dec-80	LEAD	ND	mg/l	0.005	PRIOR TO FURTHER SCRUBBING AND RINSING
2-1512	-	3627	50817	BLDG. 45-A	FINAL RINSE	13-Dec-80	22-Dec-80	CADMIUM	ND	mg/l	0.01	AFTER FURTHER SCRUBBING AND RINSING
2-1512	-	3627	50817	BLDG. 45-A	FINAL RINSE	13-Dec-80	22-Dec-80	CHROMIUM	ND	mg/l	0.02	AFTER FURTHER SCRUBBING AND RINSING
2-1512	-	3627	50817	BLDG. 45-A	FINAL RINSE	13-Dec-80	22-Dec-80	LEAD	0.25	mg/l	0.005	AFTER FURTHER SCRUBBING AND RINSING
2-1573	-	3627	50818	BLDG. 45-A	BLIND DUPLICATE	13-Dec-80	22-Dec-80	CADMIUM	ND	mg/l	0.01	AFTER FURTHER SCRUBBING AND RINSING
2-1573	-	3627	50818	BLDG. 45-A	BLIND DUPLICATE	13-Dec-80	22-Dec-80	CHROMIUM	ND	mg/l	0.02	AFTER FURTHER SCRUBBING AND RINSING

# TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S #	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
2-1573	-	3627	50818	BLDG. 45-A	BLIND DUPLICATE	13-Dec-89	22-Dec-89	LEAD	0.28	mg/l	0.005	AFTER FURTHER SCRUBBING AND RINSING
2-1513	-	3627	50827	2-B & BLDG. 45	COMPOSITE WATER SAMPLE	14-Dec-89	22-Dec-89	SILVER	ND	mg/l	0.02	COMPOSITE OF ALL RINSES DOCK 2-B AND BLDG. 45
2-1513	-	3627	50827	2-B & BLDG. 45	COMPOSITE WATER SAMPLE	14-Dec-89	22-Dec-89	ARSENIC	ND	mg/l	0.005	COMPOSITE OF ALL RINSES DOCK 2-B AND BLDG. 45
2-1513	-	3627	50827	2-B & BLDG. 45	COMPOSITE WATER SAMPLE	14-Dec-89	22-Dec-89	BARIUM	1.1	mg/l	0.2	COMPOSITE OF ALL RINSES DOCK 2-B AND BLDG. 45
2-1513	-	3627	50827	2-B & BLDG. 45	COMPOSITE WATER SAMPLE	14-Dec-89	22-Dec-89	CADMIUM	ND	mg/l	0.02	COMPOSITE OF ALL RINSES DOCK 2-B AND BLDG. 45
2-1513	-	3627	50827	2-B & BLDG. 45	COMPOSITE WATER SAMPLE	14-Dec-89	22-Dec-89	CHROMIUM	0.16	mg/l	0.05	COMPOSITE OF ALL RINSES DOCK 2-B AND BLDG. 45
2-1513	-	3627	50827	2-B & BLDG. 45	COMPOSITE WATER SAMPLE	14-Dec-89	22-Dec-89	COPPER	0.11	mg/l	0.02	COMPOSITE OF ALL RINSES DOCK 2-B AND BLDG. 45
2-1513	-	3627	50827	2-B & BLDG. 45	COMPOSITE WATER SAMPLE	14-Dec-89	22-Dec-89	MERCURY	ND	mg/l	0.005	COMPOSITE OF ALL RINSES DOCK 2-B AND BLDG. 45
2-1513	-	3627	50827	2-B & BLDG. 45	COMPOSITE WATER SAMPLE	14-Dec-89	22-Dec-89	NICKEL	ND	mg/l	0.1	COMPOSITE OF ALL RINSES DOCK 2-B AND BLDG. 45
2-1513	-	3627	50827	2-B & BLDG. 45	COMPOSITE WATER SAMPLE	14-Dec-89	22-Dec-89	LEAD	ND	mg/l	0.1	COMPOSITE OF ALL RINSES DOCK 2-B AND BLDG. 45
2-1513	-	3627	50827	2-B & BLDG. 45	COMPOSITE WATER SAMPLE	14-Dec-89	22-Dec-89	SELENIUM	ND	mg/l	0.005	COMPOSITE OF ALL RINSES DOCK 2-B AND BLDG. 45
2-1513	-	3627	50827	2-B & BLDG. 45	COMPOSITE WATER SAMPLE	14-Dec-89	22-Dec-89	ZINC	0.05	mg/l	0.01	COMPOSITE OF ALL RINSES DOCK 2-B AND BLDG. 45
2-1514	-	3632	50837	BLDG. 49	COMPOSITE SOIL SAMPLE	14-Dec-89	18-Dec-89	PGDN	ND	mg/kg	10	COMPOSITE OF SOIL FROM BENEATH TEST CELL AREAS
2-1514	-	3632	50837	BLDG. 49	COMPOSITE SOIL SAMPLE	14-Dec-89	18-Dec-89	CYANIDE	0.5	mg/kg	0.1	COMPOSITE OF SOIL FROM BENEATH TEST CELL AREAS
SAMSEL-1	-	4090	52749	BLDG. 45-A	FIELD RINSE BLANK	28-Jan-90	01-Feb-90	CADMIUM	0.003	mg/l	0.002	PRIOR TO FURTHER RINSING WITH DISTILLED WATER
SAMSEL-1	-	4090	52749	BLDG. 45-A	FIELD RINSE BLANK	28-Jan-90	01-Feb-90	CHROMIUM	ND	mg/l	0.01	PRIOR TO FURTHER RINSING WITH DISTILLED WATER
SAMSEL-1	-	4090	52749	BLDG. 45-A	FIELD RINSE BLANK	28-Jan-90	01-Feb-90	LEAD	ND	mg/l	0.01	PRIOR TO FURTHER RINSING WITH DISTILLED WATER
SAMSEL-2	-	4090	52750	BLDG. 45-A	FINAL RINSE	28-Jan-90	01-Feb-90	CADMIUM	0.005	mg/l	0.002	FURTHER RINSING WITH DISTILLED WATER
SAMSEL-2	-	4090	52750	BLDG. 45-A	FINAL RINSE	28-Jan-90	01-Feb-90	CHROMIUM	ND	mg/l	0.01	FURTHER RINSING WITH DISTILLED WATER
SAMSEL-2	-	4090	52750	BLDG. 45-A	FINAL RINSE	28-Jan-90	01-Feb-90	LEAD	0.38	mg/l	0.05	FURTHER RINSING WITH DISTILLED WATER
SAMSEL-3	-	4090	52751	BLDG. 45-A	BLIND DUPLICATE	28-Jan-90	01-Feb-90	CADMIUM	0.006	mg/l	0.002	FURTHER RINSING WITH DISTILLED WATER
SAMSEL-3	-	4090	52751	BLDG. 45-A	BLIND DUPLICATE	28-Jan-90	01-Feb-90	CHROMIUM	ND	mg/l	0.01	FURTHER RINSING WITH DISTILLED WATER
SAMSEL-3	-	4090	52751	BLDG. 45-A	BLIND DUPLICATE	28-Jan-90	01-Feb-90	LEAD	0.42	mg/l	0.05	FURTHER RINSING WITH DISTILLED WATER
SAMSEL-4	-	4090	52752	BLDG. 45-B	FIELD RINSE BLANK	28-Jan-90	01-Feb-90	CADMIUM	0.009	mg/l	0.002	PRIOR TO FURTHER RINSING WITH DISTILLED WATER
SAMSEL-4	-	4090	52752	BLDG. 45-B	FIELD RINSE BLANK	28-Jan-90	01-Feb-90	CHROMIUM	ND	mg/l	0.01	PRIOR TO FURTHER RINSING WITH DISTILLED WATER
SAMSEL-4	-	4090	52752	BLDG. 45-B	FIELD RINSE BLANK	28-Jan-90	01-Feb-90	LEAD	ND	mg/l	0.01	PRIOR TO FURTHER RINSING WITH DISTILLED WATER
SAMSEL-5	-	4090	52753	BLDG. 45-B	FINAL RINSE	28-Jan-90	01-Feb-90	CADMIUM	0.01	mg/l	0.002	FURTHER RINSING WITH DISTILLED WATER
SAMSEL-5	-	4090	52753	BLDG. 45-B	FINAL RINSE	28-Jan-90	01-Feb-90	CHROMIUM	0.29	mg/l	0.10	FURTHER RINSING WITH DISTILLED WATER
SAMSEL-5	-	4090	52753	BLDG. 45-B	FINAL RINSE	28-Jan-90	01-Feb-90	LEAD	0.90	mg/l	0.10	FURTHER RINSING WITH DISTILLED WATER
SAMSEL-6	-	4090	52754	BLDG. 45-B	BLIND DUPLICATE	28-Jan-90	01-Feb-90	CADMIUM	0.009	mg/l	0.002	FURTHER RINSING WITH DISTILLED WATER
SAMSEL-6	-	4090	52754	BLDG. 45-B	BLIND DUPLICATE	28-Jan-90	01-Feb-90	CHROMIUM	0.27	mg/l	0.10	FURTHER RINSING WITH DISTILLED WATER
SAMSEL-6	-	4090	52754	BLDG. 45-B	BLIND DUPLICATE	28-Jan-90	01-Feb-90	LEAD	0.84	mg/l	0.10	FURTHER RINSING WITH DISTILLED WATER
-	A-4	4198	53179	BLDG. 45-A	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CADMIUM	0.04	mg/l	0.02	
-	A-4	4198	53179	BLDG. 45-A	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CHROMIUM	ND	mg/l	0.05	
-	A-4	4198	53179	BLDG. 45-A	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	LEAD	ND	mg/l	0.10	
-	A-5	4198	53177	BLDG. 45-A	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CADMIUM	0.03	mg/l	0.02	
-	A-5	4198	53177	BLDG. 45-A	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CHROMIUM	ND	mg/l	0.05	
-	A-5	4198	53177	BLDG. 45-A	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	LEAD	ND	mg/l	0.10	
-	A-10	4198	53178	BLDG. 45-A	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CADMIUM	0.04	mg/l	0.02	
-	A-10	4198	53178	BLDG. 45-A	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CHROMIUM	ND	mg/l	0.05	
-	A-10	4198	53178	BLDG. 45-A	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	LEAD	ND	mg/l	0.10	
-	B-4	4198	53182	BLDG. 45-B	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CADMIUM	0.04	mg/l	0.02	
-	B-4	4198	53182	BLDG. 45-B	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CHROMIUM	ND	mg/l	0.05	
-	B-4	4198	53182	BLDG. 45-B	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	LEAD	ND	mg/l	0.10	
-	B-10	4198	53183	BLDG. 45-B	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CADMIUM	0.03	mg/l	0.02	
-	B-10	4198	53183	BLDG. 45-B	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CHROMIUM	ND	mg/l	0.05	
-	B-10	4198	53183	BLDG. 45-B	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	LEAD	ND	mg/l	0.10	

# TRW TAPCO CLOSURE - ANALYTICAL RESULTS

APPENDIX B

TRW #	E-S #	REPORT #	LAB #	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS ON	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
-	B-20	4198	53180	BLDG. 45-B	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CADMIUM	0.04	mg/l	0.02	
-	B-20	4198	53180	BLDG. 45-B	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CHROMIUM	ND	mg/l	0.05	
-	B-20	4198	53180	BLDG. 45-B	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	LEAD	ND	mg/l	0.10	
-	B-21	4198	53181	BLDG. 45-B	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CADMIUM	0.04	mg/l	0.02	
-	B-21	4198	53181	BLDG. 45-B	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	CHROMIUM	ND	mg/l	0.05	
-	B-21	4198	53181	BLDG. 45-B	CONCRETE SAMPLE	06-Feb-90	12-Feb-90	LEAD	ND	mg/l	0.10	
-	B-8	4198	53184	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	12-Feb-90	CADMIUM	0.03	mg/l	0.02	
-	B-8	4198	53184	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	12-Feb-90	CHROMIUM	ND	mg/l	0.05	
-	B-8	4198	53184	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	12-Feb-90	LEAD	ND	mg/l	0.10	
-	B-26	4198	53185	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	12-Feb-90	CADMIUM	0.04	mg/l	0.02	
-	B-26	4198	53185	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	12-Feb-90	CHROMIUM	ND	mg/l	0.05	
-	B-26	4198	53185	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	12-Feb-90	LEAD	ND	mg/l	0.10	
-	E-30	4198	53186	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	12-Feb-90	CYANIDE	ND	mg/kg	0.10	STAINED CONC. REMOVED BY SAMSEL (REACTIVITY)
-	E-30	4198	53186	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	13-Feb-90	SULFIDE	ND	mg/kg	25	STAINED CONC. REMOVED BY SAMSEL (REACTIVITY)
-	E-30	4198	53186	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	09-Feb-90	pH	8.7	S.U.	-	STAINED CONC. REMOVED BY SAMSEL (CORROSIVITY)
-	E-30	4198	53186	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	20-Feb-90	SILVER	0.08	mg/l	0.02	STAINED CONC. REMOVED BY SAMSEL (EP-TOX METALS)
-	E-30	4198	53186	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	20-Feb-90	ARSENIC	0.012	mg/l	0.005	STAINED CONC. REMOVED BY SAMSEL (EP-TOX METALS)
-	E-30	4198	53186	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	15-Feb-90	BARIUM	0.63	mg/l	0.05	STAINED CONC. REMOVED BY SAMSEL (EP-TOX METALS)
-	E-30	4198	53186	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	12-Feb-90	CADMIUM	0.04	mg/l	0.02	STAINED CONC. REMOVED BY SAMSEL (EP-TOX METALS)
-	E-30	4198	53186	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	12-Feb-90	CHROMIUM	130	mg/l	10	STAINED CONC. REMOVED BY SAMSEL (EP-TOX METALS)
-	E-30	4198	53186	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	23-Feb-90	MERCURY	ND	mg/l	0.005	STAINED CONC. REMOVED BY SAMSEL (EP-TOX METALS)
-	E-30	4198	53186	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	12-Feb-90	LEAD	ND	mg/l	0.10	STAINED CONC. REMOVED BY SAMSEL (EP-TOX METALS)
-	E-30	4198	53186	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	20-Feb-90	SELENIUM	0.032	mg/l	0.005	STAINED CONC. REMOVED BY SAMSEL (EP-TOX METALS)
-	E-31	4528	54526	BLDG. 45-B	CONCRETE SAMPLE	01-Mar-90	07-Mar-90	CADMIUM	0.08	mg/l	0.02	
-	E-31	4528	54526	BLDG. 45-B	CONCRETE SAMPLE	01-Mar-90	07-Mar-90	CHROMIUM	0.08	mg/l	0.05	
-	E-31	4528	54526	BLDG. 45-B	CONCRETE SAMPLE	01-Mar-90	07-Mar-90	LEAD	ND	mg/l	0.10	
-	E-32	4528	54527	BLDG. 45-B	COMPOSITE CONCRETE	01-Mar-90	07-Mar-90	CADMIUM	0.08	mg/l	0.02	
-	E-32	4528	54527	BLDG. 45-B	COMPOSITE CONCRETE	01-Mar-90	07-Mar-90	CHROMIUM	ND	mg/l	0.05	
-	E-32	4528	54527	BLDG. 45-B	COMPOSITE CONCRETE	01-Mar-90	07-Mar-90	LEAD	ND	mg/l	0.10	
-	E-33	4528	54528	BLDG. 45-B	CONCRETE SAMPLE	01-Mar-90	07-Mar-90	CADMIUM	0.07	mg/l	0.02	
-	E-33	4528	54528	BLDG. 45-B	CONCRETE SAMPLE	01-Mar-90	07-Mar-90	CHROMIUM	1.2	mg/l	0.05	
-	E-33	4528	54528	BLDG. 45-B	CONCRETE SAMPLE	01-Mar-90	07-Mar-90	LEAD	ND	mg/l	0.10	
-	E-34	4528	54529	BLDG. 45-B	CONCRETE SAMPLE	01-Mar-90	07-Mar-90	CADMIUM	0.07	mg/l	0.02	
-	E-34	4528	54529	BLDG. 45-B	CONCRETE SAMPLE	01-Mar-90	07-Mar-90	CHROMIUM	2.4	mg/l	0.05	
-	E-34	4528	54529	BLDG. 45-B	CONCRETE SAMPLE	01-Mar-90	07-Mar-90	LEAD	ND	mg/l	0.10	
-	E-35	4528	54530	BLDG. 45-B	PAINT	01-Mar-90	08-Mar-90	LEAD	1800	mg/kg	10	TOTAL Pb
-	E-30	5133	57377	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	11-Apr-90	CADMIUM	3.8	mg/kg	2.0	STAINED CONC. REMOVED BY SAMSEL (TOTAL Cd)
-	E-30	5133	57377	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	11-Apr-90	CHROMIUM	2500	mg/kg	50	STAINED CONC. REMOVED BY SAMSEL (TOTAL Cr)
-	E-30	5133	57377	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	11-Apr-90	HEX CHROMIUM	1700	mg/kg	100	STAINED CONC. REMOVED BY SAMSEL (TOTAL HEX. Cr)
-	E-30	5133	57377	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	11-Apr-90	LEAD	170	mg/kg	10	STAINED CONC. REMOVED BY SAMSEL (TOTAL Pb)
-	E-36	5287	58063	BLDG. 45-B	COMPOSITE CONCRETE	19-Apr-90	25-Apr-90	CADMIUM	0.02	mg/l	0.02	FROM 2" CONCRETE REMOVAL AREA
-	E-36	5287	58063	BLDG. 45-B	COMPOSITE CONCRETE	19-Apr-90	25-Apr-90	CHROMIUM	0.05	mg/l	0.05	FROM 2" CONCRETE REMOVAL AREA
-	E-36	5287	58063	BLDG. 45-B	COMPOSITE CONCRETE	19-Apr-90	25-Apr-90	LEAD	ND	mg/l	0.10	FROM 2" CONCRETE REMOVAL AREA
-	E-37	5287	58064	BLDG. 45-B	COMPOSITE CONCRETE	19-Apr-90	25-Apr-90	CADMIUM	0.03	mg/l	0.02	FROM 1/2" CONCRETE REMOVAL AREA
-	E-37	5287	58064	BLDG. 45-B	COMPOSITE CONCRETE	19-Apr-90	25-Apr-90	CHROMIUM	0.16	mg/l	0.05	FROM 1/2" CONCRETE REMOVAL AREA
-	E-37	5287	58064	BLDG. 45-B	COMPOSITE CONCRETE	19-Apr-90	25-Apr-90	LEAD	ND	mg/l	0.10	FROM 1/2" CONCRETE REMOVAL AREA
-	E-30	5447	58680	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	01-May-90	COPPER	0.13	mg/l	0.02	STAINED CONC. REMOVED BY SAMSEL
-	E-30	5447	58680	BLDG. 45-B	CONCRETE SAMPLE	07-Feb-90	01-May-90	ZINC	0.03	mg/l	0.01	STAINED CONC. REMOVED BY SAMSEL

**APPENDIX C**  
**CORRESPONDENCE WITH THE CITY OF EUCLID**

**Environmental Services**

15311 Vantage Parkway West  
Suite 300  
Houston, TX 77032  
713.590.4500  
FAX 713.449.3945

October 5, 1989

Mr. Andrew Resetar.  
TRW Inc.  
1900 Richmond Road  
Cleveland, Ohio 44124

Reference: Decon Water Disposal  
TAPCO Project

Dear Andy:

Bruce Richardson, Mike Lyden and I met with Jack Bazan of the Euclid Water Department (216/289-2810) Wednesday morning, 10/4/89, to discuss requirements for discharge of our decon and collected waters into the city's sanitary sewer system. We described to Jack the history of the site, source of the water, and the fact that none of the suspect pollutants have been detected in the site monitoring wells.

As a result of our discussion, the following procedure will be implemented:

1. Collect water sample from the frac tank.
2. Analyze for PGDN, total cyanide, amenable cyanide, 8 RCRA metals, zinc, nickel, copper and visible surface sheen.
3. Analytical results will be reported to you, Bruce Richardson, and Engineering Science.
4. Report results to Jack Bazan with attached statement that water is non-hazardous.
5. Get approval to discharge from all parties above.
6. Discharge to nearest sanitary sewer drain (no rate limit).

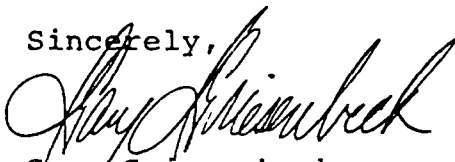
Mr. Andrew Resetar  
October 5, 1989  
Page 2

Of course, this procedure assumes that the water will meet discharge requirements. Maximum limits per Jack are as follows:

	<u>Units (mg/l)</u>
PGDN	Not specified
Cyanide, total	10
Cyanide, amenable	2
Arsenic	Not specified
Barium	Not specified
Cadmium	.5128
Chromium	.821
Copper	1.234
Lead	.3098
Mercury	.0026
Nickel	.387
Selenium	Not specified
Silver	Not specified
Zinc	3.45
Sheen	Non-visible

The west frac tank is about 90% full (18,000 gal.) and no more water will be pumped into it. It will be sampled 10/5/89 and results will be back in one week. The east frac tank is only about 30 percent full (6,000 gal.) and will be tested when full or after final decon, whichever comes first. If the water does not meet discharge requirements, we will consider on-site treatment prior to discharge. If this option is not acceptable or too costly we will incinerate water as per plan.

Sincerely,

  
Gary Griesenbeck  
Operations Manager

JAO301

cc: Glen Dieterle ✓  
Mike Lyden

## Environmental Services

15311 Vantage Parkway West  
Suite 300  
Houston, TX 77032  
713.590.4500  
FAX 713.449.3945

November 6, 1989

Mr. Jack Bazan  
Waste Water Treatment  
City of Euclid  
585 East 222nd  
Euclid, OH 44123

Dear Jack:

Subsequent to our discussion on October 4, 1989, concerning discharge of decon water at the TAPCO test facility, we have analyzed the collected waters per the criteria you requested. The following shows the results of this analysis:

<u>Component</u>	<u>Limits per Our Discussion (mg/l)</u>	(1) <u>Detection Limits (mg/l)</u>	<u>Results of Analysis (mg/l)</u>	
			<u>Tank 1</u>	<u>Tank 2</u>
PGDN	Not specified	(2) 10.0/0.20	110.0	0.4
Cyanide, (total)	10	.01	0.2	ND
Cyanide, (amenable)	2	.01	0.2	ND
Arsenic	Not specified	.005	ND	ND
Barium	Not specified	.200	ND	ND
Cadmium	.5128	.020/.010	ND	ND
Chromium	.821	.050	ND	ND
Copper	1.234	.020/.200	ND	ND
Lead	.3098	.100/.050	ND	ND
Mercury	.0026	.005/.002	ND	ND
Nickel	.387	.100	ND	ND
Selenium	Not specified	.005	ND	ND
Silver	Not specified	.020	ND	ND
Zinc	3.45	.010/.050	0.3	ND
Sheen	Non-visible	N/A	ND	ND

Notes: 1) Where two values are shown; Tank No. 1 limit/Tank No. 2 limit.

2) 0.20 is the lowest possible detection limit for PGDN.

Mr. Jack Bazan  
November 6, 1989  
Page 2

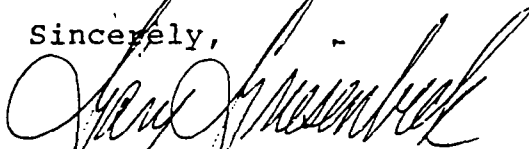
Each tank contains approximately 18,000 gallons of water. Tank No. 1 was sampled on 10/5/89 and Tank 2 on 10/20/89 and the analysis was performed by Wadsworth Laboratories.

We request your approval to discharge the contents of Tank No. 2 into the sanitary sewer drain located on the site. Once this tank is empty we will transfer the contents of Tank No. 1 through a carbon filter and into Tank No. 2. We will then take a composite sample and analyze for remaining PGDN. If the PGDN content is below your discharge limit we will then make a request to discharge to sanitary sewer.

We can control the period and rate of discharge to match your plant demand schedule if you feel it would help.

Thank you for your assistance.

Sincerely,



Gary Griesenbeck  
Operations Manager

JAO332

cc: Glen Dieterle  
Mike Lyden  
Mark Osterman  
Andrew Resetar  
Dennis Tennefos



## City of Euclid

A CITY OF SUPERIOR SERVICES

David M. Lynch, Mayor • 585 East 222nd Street • Euclid, Ohio 44123 • (216) 289-2700

John A. Piscitello  
*Director of Public Services*

November 8, 1989

Gary Griesenbeck  
TRW, Inc.  
Environmental Services  
15311 Vantage Parkway West  
Suite 300  
Houston, TX 77032

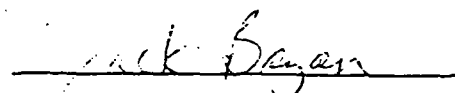
Dear Gary,

Thank you for your immediate response in submitting the analytical data in regards to the decon water from the TAPCO test facility site. This letter is in response to your request to discharge the contents of tank no. 2 to the sanitary sewer. We will approve the discharge under the following conditions:

1. The discharge rate to the sanitary sewer should not exceed 800 gal/hour.
2. Discharge to the sanitary sewer shall be limited to the hours of 8:00 a.m. to 8:00 p.m.

We are requesting these conditions due to the uniqueness of PGDN. Please notify our office when your discharge schedule is finalized.

Sincerely,

  
Jack Bazan  
Lab Manager

Environmental Services

15311 Vantage Parkway West  
Suite 300  
Houston, TX 77032  
713.590.4500  
FAX 713.449.3945

November 28, 1989

RECEIVED  
NOV 29 1989  
CLEVELAND ES

Mr. Jack Bazan  
Waste Water Treatment  
City of Euclid  
585 East 222nd  
Euclid, OH 44123

Dear Jack:

Subsequent to our telephone discussion today, concerning discharge of decon water at the TAPCO test facility, we have analyzed the second batch of collected waters per the criteria you requested. This batch of 15,000 gallons was treated through carbon filtration. The following shows the results of this analysis:

Component	Limits per Our Discussion (mg/l)	Detection Limits (mg/l)	Results of Analysis (mg/l)	
			Treated	Tank 2
PGDN	Not specified	0.1		ND
Cyanide, (total)	10	.01		.09
Cyanide, (amenable)	2	.01		.05
Arsenic	Not specified	.005		ND
Barium	Not specified	.01		.06
Cadmium	.5128	.010		ND
Chromium	.821	.050		ND
Copper	1.234	.200		ND
Lead	.3098	.050		ND
Mercury	.0026	.002		ND
Nickel	.387	.100		ND
Selenium	Not specified	.005		ND
Silver	Not specified	.020		ND
Zinc	3.45	.01		.06
Sheen	Non-visible	N/A		ND

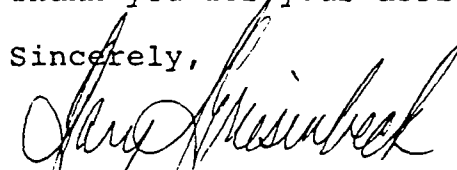
Mr. Jack Bazan  
November 28, 1989  
Page 2

We request your approval to discharge the contents of Tank No. 2 as described above into the sanitary sewer drain located on the site.

We will limit our discharge to 800 gph and will discharge between 8:00 a.m. and 8:00 p.m., only as per the previous guidelines stated in your letter of November 8, 1989.

Thank you for your assistance.

Sincerely,



Gary Griesenbeck  
Operations Manager

JA0332

cc: Glen Dieterle  
Mike Lyden  
Mark Osterman  
Andrew Resetar  
Dennis Tennefos



# City of Euclid

A CITY OF SUPERIOR SERVICES

David M. Lynch, Mayor • 585 East 222nd Street • Euclid, Ohio 44123 • (216) 289-2700

John A. Placitello  
Director of Public Services

November 29, 1989

Gary Griesenbeck  
TRW, Inc.  
Environmental Services  
15311 Vantage Parkway West  
Suite 300  
Houston, TX 77032

Dear Gary,

In view of the analytical data as submitted in your letter of November 28, 1989 we grant your request to discharge the 15,000 gallon contents of tank no. 2 into the sanitary sewer. Please adhere to the guidelines as stipulated in your letter, an 800 gph maximum, and discharge hours of 8:00 a.m. through 8:00 p.m.. We also request that you notify our office as to your discharge schedule.

Sincerely,

  
\_\_\_\_\_  
Jack Bazar  
Lab Manager

**APPENDIX D**  
**SURVEY INFORMATION**

# LAKE INC.

ENGINEERING & SURVEYING

30601 EUCLID AVENUE - WICKLIFFE, OHIO 44092 — (216) 585-2700

P. O. BOX 317 - WICKLIFFE, OHIO 44092

September 1, 1989

TRW E.S.  
15311 Vantage Parkway West #300  
Houston, Texas 77032

ATTN: Mr. Gary Griesenbeck

RE: Torpedo Testing Site,  
Euclid, Ohio

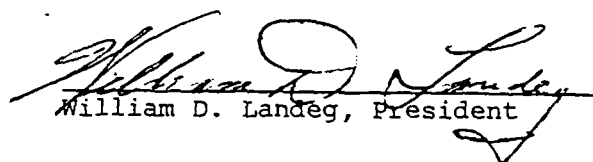
Dear Mr. Griesenbeck,

Enclosed please find the field notes from the work performed on August 30, 1989 and August 31, 1989 at the former T.R.W. Torpedo Testing Site in Euclid, Ohio. Field work was performed by John Jansky, Registered Surveyor No. 6440 of Lake, Inc. Engineers and Surveyors, Wickliffe, Ohio.

Should you have any questions, please feel free to contact us at your convenience.

Yours truly,

LAKE, INC. ENGINEERS & SURVEYORS

  
William D. Landeg, President

WDL:ac

enclosure

# TRW Euclid

89-145

NOTE: BASE LINE Re-established

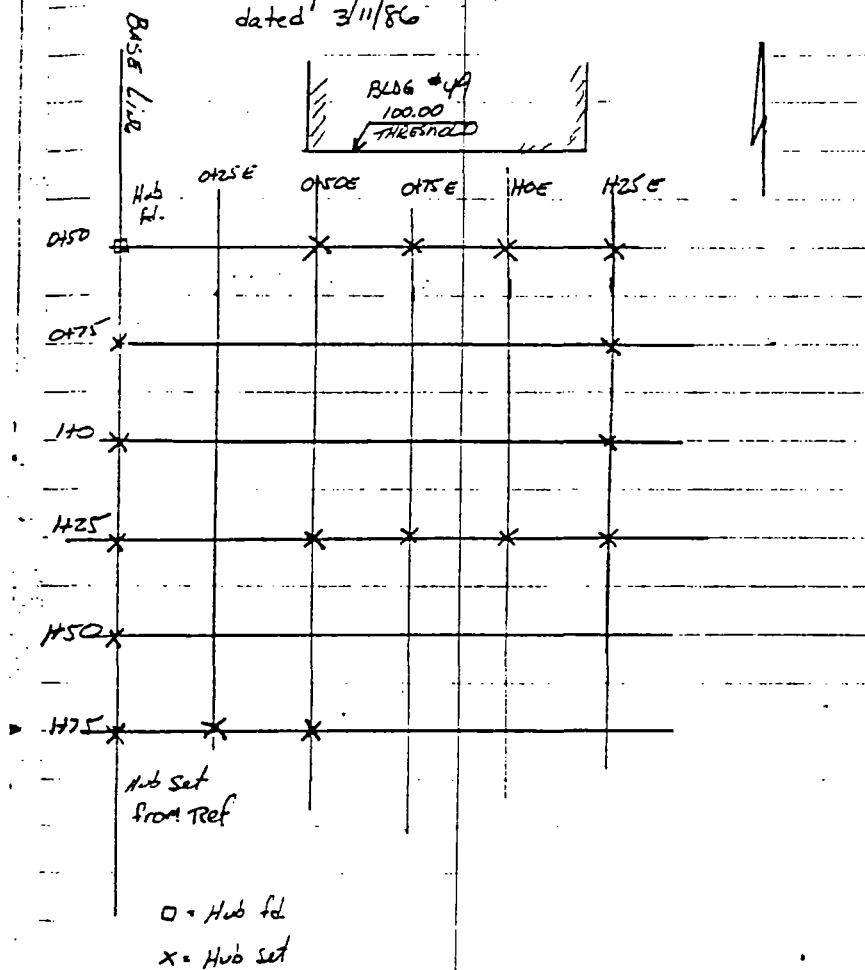
8-30-89

Along with GRID from Field notes

8-31-89

at Mark Straub of Engineering Science

dated 3/11/86



TOPOGRAPHIC SURVEY			
STATION ALONG STREAM	INV.	ELEV. (4.11)	
1	8.66	8.48	INV. @ CULVERT PIPE
	95.45	95.63	
2	8.93	8.14	INTERSECTION @ GRID
	95.18	95.97	
3	7.63	7.15	
	96.48	96.96	
4	7.49	7.04	
	96.62	97.07	
5	7.23	7.05	
	96.88	97.06	
6	6.79	6.59	
	97.32	97.52	

#### BASE LINE DESCRIPTION:

(= 10' OFF W. FACE CONC. STEAM PIPE SUPPORT PIERS)

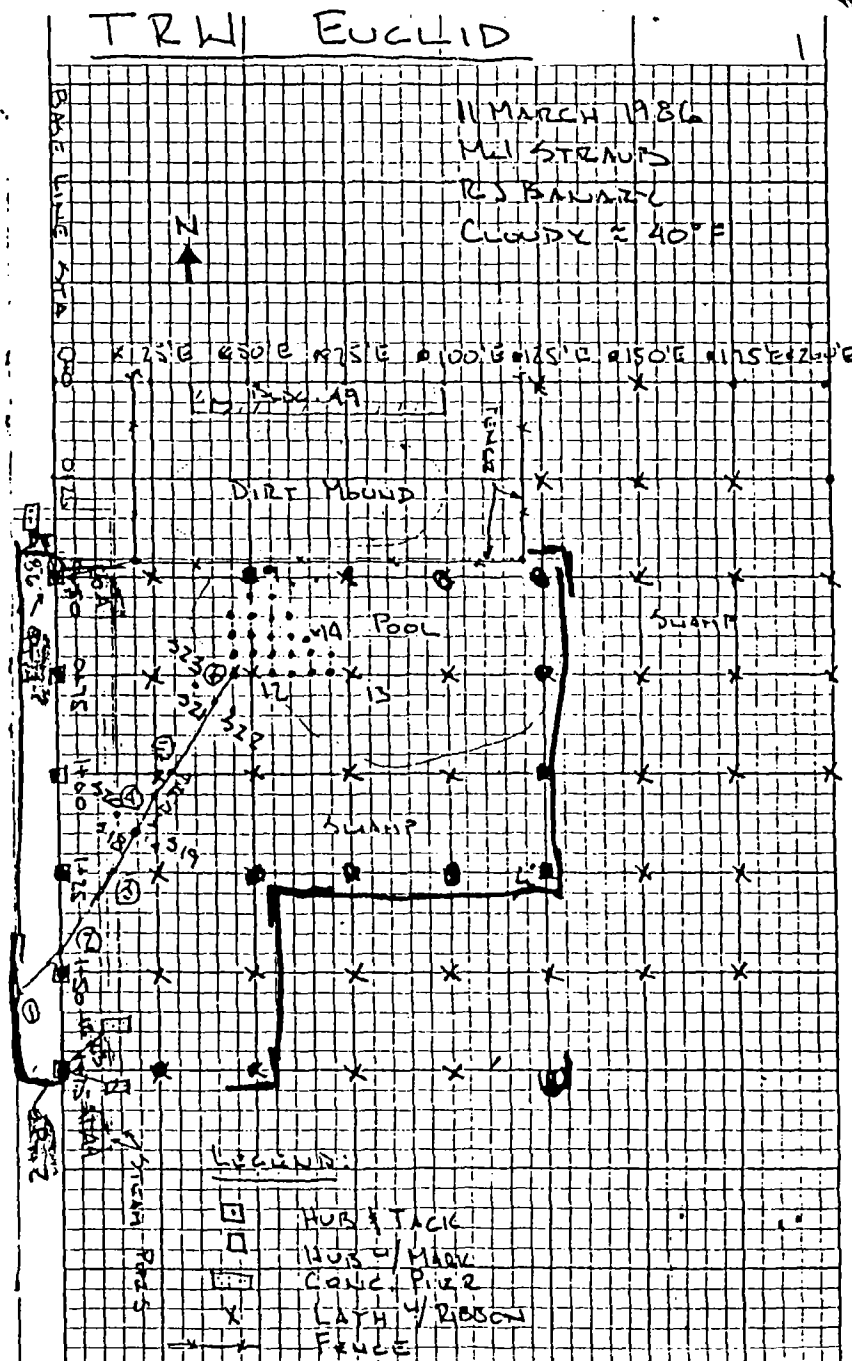
#### POINT No. 1:

STA. 0+50.00'E, HUB & TACK (SRT) 20.47'  
FROM SW CORNER FENCE POST AND  
9.26' FROM SE CORNER OF CONC.  
STEAM PIPE SUPPORT PIER.

#### POINT No. 2:

STA. 1+75.00'E, HUB & MARK 11.44' FROM  
NW CORNER OF CONC. STEAM PIPE  
SUPPORT PIER AND 16.63' FROM SW  
CORNER OF ANOTHER SUPPORT PIER.

## TRW EUCLID



Mack  
Strauss

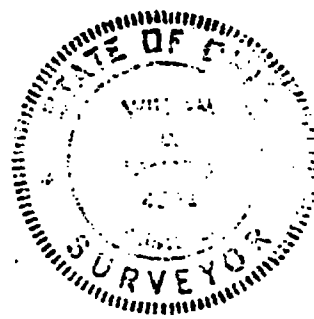
Engineering  
Science

LOCATION OF BUILDING, HYDRANT,  
SOIL SAMPLING GRID, AND FINISH  
FLOOR ELEVATION

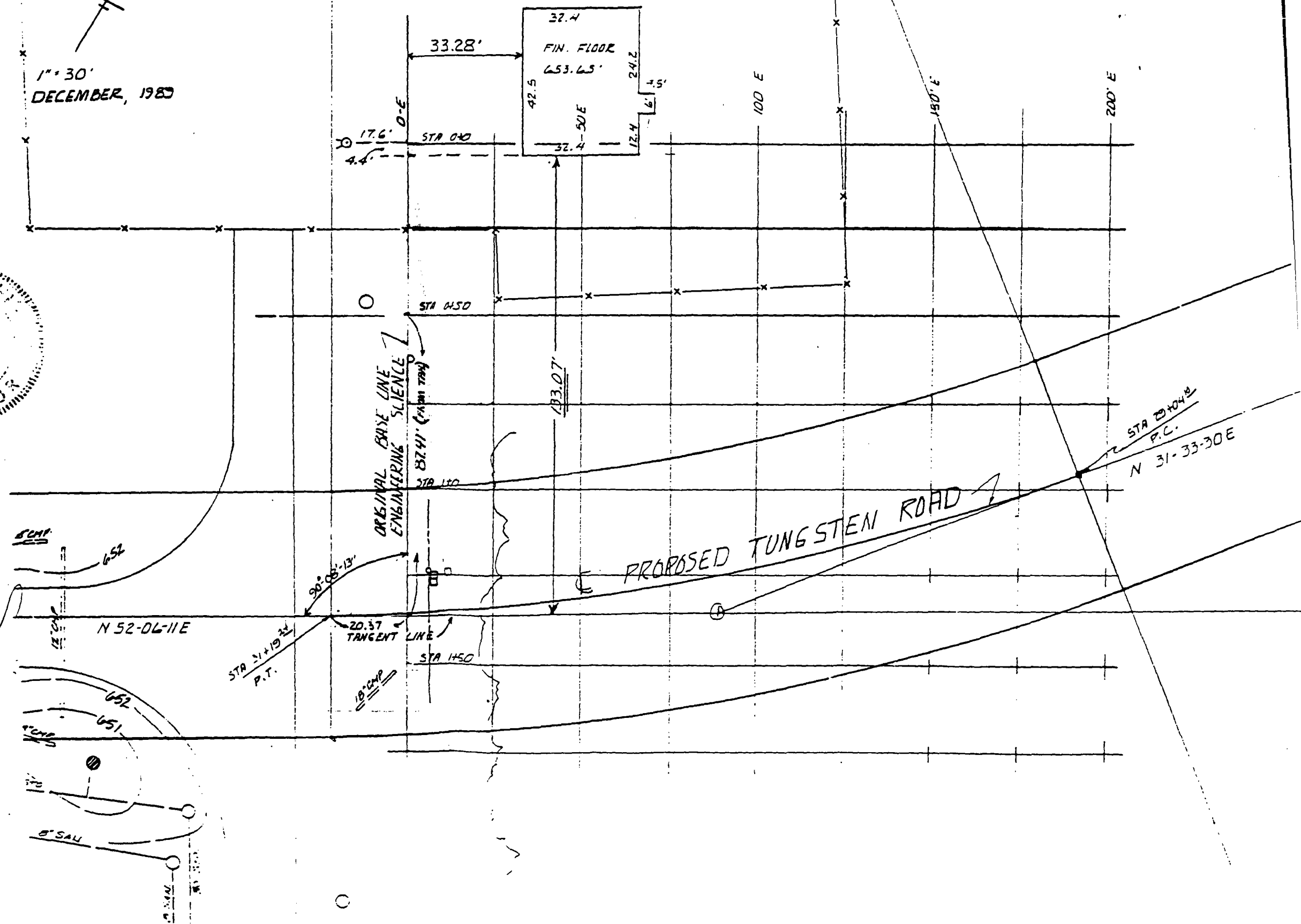
1" = 30'  
DECEMBER, 1983

☐ CURVE DATA  
R = 600.00'  
T = 108.74  
Δ = 20° 32' 41"  
A = 215.14  
C = 213.99  
BPL N 41-49-50.5 E

LAKE INC..  
ENGINEERS AND SURVEYORS  
30601 EUCLID AVE  
WILLOWICK OHIO 44095  
(216) 585-2700



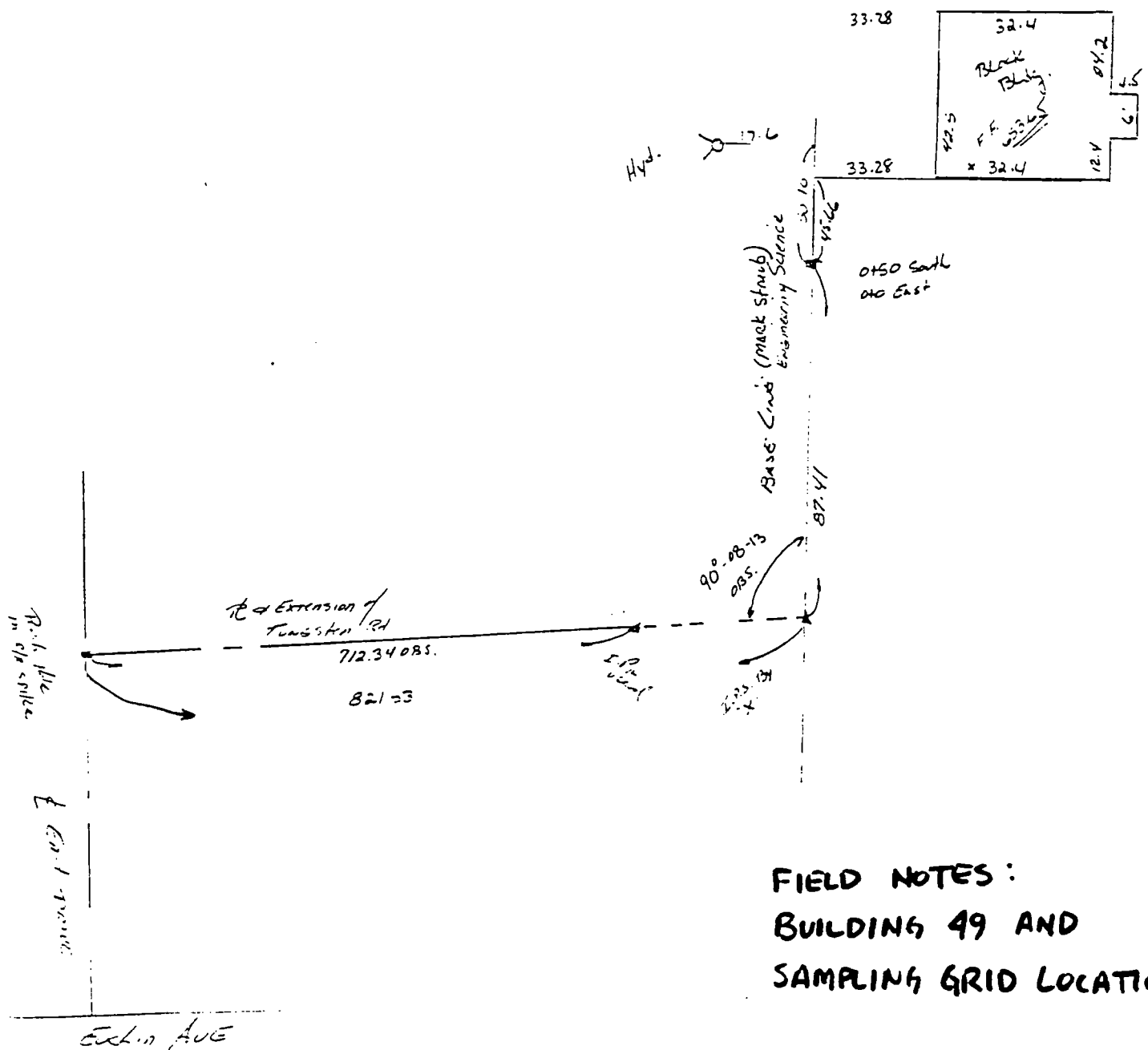
EAST DRIVE



12.55

Locate 12-15  
Hwy 1  
Base -

11-29-89  
JJ  
RS.



FIELD NOTES:  
BUILDING 49 AND  
SAMPLING GRID LOCATION

11-27-82

Bench Run For

F. L. T. U

H. I

ELEV.

3.4

+

1.98

660.20

658.22

7.01

653.19

T.P. #1

4.55

657.24

4.23

652.55

P.I

3.59

653.65

F.O.

ADD 553.65 for conversion

**APPENDIX E**

- I. Summary of Wastes
- II. Manifests
- III. Destruction/Disposal Certificates

**APPENDIX E**

**I. SUMMARY OF WASTES**

## APPENDIX E

## I. SUMMARY OF WASTES

MANIFEST NUMBER	HAUL DATE	DESCRIPTION	PC #	QUANTITY	DISPOSAL FACILITY	DESTRUCTION DATE
1	9/13/89	Contaminated Soil	HR-57	40,520 P	1	9/16/89
2	9/13/89	Contaminated Soil	HR-57	40,590 P	1	9/17/89
3	9/14/89	Contaminated Soil	HR-57	33,900 P	1	9/18/89
4	9/14/89	Contaminated Soil	HR-57	36,440 P	1	9/18/89
5	9/15/89	Contaminated Soil	HR-57	44,240 P	1	9/19/89
6	9/15/89	Contaminated Soil	HR-57	45,000 P	1	9/19/89
7	9/16/89	Contaminated Soil	HR-57	41,920 P	1	9/20/89
8	9/16/89	Contaminated Soil	HR-57	41,220 P	1	9/20/89
9	9/20/89	Contaminated Soil	HR-57	43,640 P	1	9/22/89
10	9/20/89	Contaminated Soil	HR-57	44,250 P	1	9/22/89
11	9/22/89	Contaminated Soil	HR-57	43,120 P	1	9/28/89
12	9/27/89	Contaminated Soil	HR-57	43,060 P	1	9/30/89
13	9/27/89	Contaminated Soil	HR-57	42,310 P	1	9/30/89
14	10/2/89	Contaminated Soil	HR-57	42,960 P	1	10/10/89
15	10/2/89	Contaminated Soil	HR-57	44,160 P	1	10/10/89
16	12/7/89	Contaminated Soil	HR-57	47,800 P	1	01/01/90
1	12/6/89	Decon Water	HS-89	42,140 P	1	01/22/90
2	12/7/89	Wood Blocks	HS-41	6,700 P	1	01/03/90
1	12/8/89	Carbon Filter Drums	HR-57	110 G	1	01/22/90
		Steel Tank Drums	HT-14	220 G	1	01/22/90
		Soil/Gravel Drums	HR-57	440 G	1	01/22/90
N/A	11/14/89	Asbestos Pipe Insulation	N/A	7 Drums	2	N/A

## APPENDIX E

## I. . SUMMARY OF WASTES (CONTINUED)

MANIFEST NUMBER	HAUL DATE	DESCRIPTION	PC #	QUANTITY	DISPOSAL FACILITY	DESTRUCTION DATE
	11/15/89	Asbestos Pipe Insulation	N/A	6 Drums	2	N/A
N/A	11/28/89	Asbestos Roofing Material	N/A	153 Bags	2	N/A
N/A	12/1/89	Steel Scrap	N/A	*1 Load	3	N/A
N/A	12/1/89	Concrete Rubble from UST's	N/A	*1 Load	4	N/A
N/A	12/9/89 thru 12/20/89	Concrete Rubble From Building 49 Demolition	N/A	*15 Loads	3	N/A
N/A	12/20/89	Steel Scrap	N/A	*1 Load	5	N/A
N/A	11/8/89 thru 11/10/89	Decon Water East Tank (Tank #1)	N/A	18,000 G	6	N/A
N/A	11/29/89	Decon & UST Water, West Tank (Tank #2)	N/A	13,000 G	6	N/A
1	3/23/90	Rinse waters from Dock 2-B and Building 45	R52706	475 G	7	3/23/90
—	—	Concrete removed from Building 45	—	7 Drums	8	N/A

NOTES:

N/A - Not Applicable

(1) LWD, Inc., Calvert City, Kentucky

(2) S &amp; S Landfill, Clarksburg, West Virginia

(3) Lake County Landfill, Chesterland, Ohio

(4) Inland Reclamation, Glen Willow, Ohio

(5) Alpha Metals, Cleveland, Ohio

(6) City of Euclid, Ohio Wastewater Treatment Plant via sanitary sewer

(7) Clean Harbors of Cleveland, Cleveland, Ohio

(8) ES01, Oregon, Ohio

\* 1 load is approximately 14 cubic yards.

**APPENDIX E**  
**II. MANIFESTS**

SEP 20 1989

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0032. Expires 9-30-91

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. 0 H D 0 0 4 1 7 9 4 5 3 0 0 0 0 1		Manifest Document No. 0 0 0 0 0 1		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.						
3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Rd., Cleveland, OH 44124						A. State Manifest Document Number								
4. Generator's Phone ( 216 ) 291-7839						B. State Generator's ID								
5. Transporter 1 Company Name LWD Trucking, Inc.			6. US EPA ID Number K Y D 9 8 1 4 7 7 8 2 1			C. State Transporter's ID								
7. Transporter 2 Company Name			8. US EPA ID Number			D. Transporter's Phone								
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029			10. US EPA ID Number K Y D 0 8 8 4 3 8 8 1 7			E. State Transporter's ID								
						F. Transporter's Phone								
						G. State Facility's ID								
						H. Facility's Phone								
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		1. Waste No.		
a. <input type="checkbox"/> HM RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA9189						No. Type								
						0 0 1 D T		40 5 2 0		P		D003		
b.														
c.														
d.														
J. Additional Descriptions for Materials Listed Above Soil contaminated with "OTTO" fuel residue. Principle constituent is propylene glycol dinitrate. LWD PC # HR-57						K. Handling Codes for Wastes Listed Above T06/T07								
15. Special Handling Instructions and Additional Information If transporter is unable to deliver waste to designated facility, he should contact a TRW representative at (216)692-6330 or (713)590-4500.														
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.														
Printed/Typed Name Dennis Tennefos for TRW Inc.					Signature Dennis Tennefos for TRW					Month Day Year 09/13/89				
17. Transporter 1 Acknowledgement of Receipt of Materials														
Printed/Typed Name Roger L Croft					Signature Roger L Croft					Month Day Year 09/13/89				
18. Transporter 2 Acknowledgement of Receipt of Materials														
Printed/Typed Name					Signature					Month Day Year				
19. Discrepancy Indication Space														
Public reporting burden for this collection is estimated to average 37 minutes for generators, 15 minutes for transporters, and 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20503														
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.														
Printed/Typed Name Kean McKinney					Signature Kean McKinney					Month Day Year 09/14/89				

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. 0 H D 0 0 4 1 7 9 4 5 3 0 0 0 0 2		Manifest Document No.		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Rd., Cleveland, OH 44124						A. State Manifest Document Number			
4. Generator's Phone ( 216 ) 291-7839						B. State Generator's ID			
5. Transporter 1 Company Name LWD Trucking, Inc.				6. US EPA ID Number K Y D 9 8 1 4 7 7 8 2 1		C. State Transporter's ID			
7. Transporter 2 Company Name				8. US EPA ID Number		D. Transporter's Phone			
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029						10. US EPA ID Number K Y D 0 8 8 4 3 8 8 1 7		E. State Transporter's ID	
								F. Transporter's Phone	
								G. State Facility's ID	
								H. Facility's Phone	
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers No. Type		13. Total Quantity	
a. <input type="checkbox"/> HM RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA9189						0 0 1 D T		4 0 5 9 0 P	
b. <input type="checkbox"/>									
c. <input type="checkbox"/>									
d. <input type="checkbox"/>									
J. Additional Descriptions for Materials Listed Above Soil contaminated with "OTTO" fuel residue. Principle constituent is propylene glycol dinitrate. LWD PC #HR-57						K. Handling Codes for Wastes Listed Above T06/T07			
15. Special Handling Instructions and Additional Information If transporter is unable to deliver waste to designated facility, he should contact a TRW representative at (216)692-6330 or (713)590-4500.									
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.									
Printed/Typed Name Dennis Tennesfos for TRW Inc.					Signature Dennis Tennesfos for TRW			Month Day Year 10 9 1 3 89	
17. Transporter 1 Acknowledgement of Receipt of Materials									
Printed/Typed Name Joe Moreland					Signature Joe Moreland			Month Day Year 10 9 1 3 89	
18. Transporter 2 Acknowledgement of Receipt of Materials									
Printed/Typed Name					Signature			Month Day Year	
19. Discrepancy Indication Space									
<p style="text-align: center;"><b>AGENCY DISPLAY OF ESTIMATED BURDEN</b></p> <p>Public reporting burden for this collection is estimated to average 37 minutes for generators, 15 minutes for transporters, and 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20503.</p>									
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.									
Printed/Typed Name Kean McKimney					Signature Kean McKimney			Month Day Year 9 1 4 89	

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. 0 H D 0 0 4 1 7 9 4 5 3 0 0 0 0 3		Manifest Document No. 0 0 0 0 0 3		2. Page 1 of 1		Information in the shaded area is not required by Federal law.					
3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Rd., Cleveland, OH 44124						A. State Manifest Document Number							
4. Generator's Phone ( 216 ) 291-7839						B. State Generator's ID							
5. Transporter 1 Company Name LWD Trucking, Inc.			6. US EPA ID Number K Y D 9 8 1 4 7 7 8 2 1			C. State Transporter's ID							
7. Transporter 2 Company Name			8. US EPA ID Number			D. Transporter's Phone							
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029			10. US EPA ID Number K Y D 0 8 8 4 3 8 8 1 7			E. State Transporter's ID							
						F. Transporter's Phone							
						G. State Facility's ID							
						H. Facility's Phone							
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA9189						No. Type		33900		P		D003	
b.													
c.													
d.													
J. Additional Descriptions for Materials Listed Above Soil contaminated with "OTTO" fuel residue. Principle constituent is propylene glycol dinitrate. LWD PC # HR-57						K. Handling Codes for Wastes Listed Above T06/T07							
15. Special Handling Instructions and Additional Information If transporter is unable to deliver waste to designated facility, he should contact a TRW representative at (216)692-6330 or (713)590-4500.													
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.													
Printed/Typed Name Dennis Tennesfos for TRW Inc.					Signature Dennis Tennesfos for TRW			Month Day Year 10/9/1/4/8					
17. Transporter 1 Acknowledgement of Receipt of Materials													
Printed/Typed Name BRIKE Taylor					Signature Brike Taylor			Month Day Year 10/9/1/4/8					
18. Transporter 2 Acknowledgement of Receipt of Materials													
Printed/Typed Name					Signature			Month Day Year					
19. Discrepancy Indication Space													
Public reporting burden for this collection is estimated to average: 37 minutes for generators, 15 minutes for transporters, 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460.													
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.													
Printed/Typed Name Kean McKinney					Signature Kean McKinney			Month Day Year 10/11/5/8					

SEP 20 1989

Please print or type. (Form designed for use on a 12-pitch typewriter.)

Form Approved: OMB No. 2050-0039 Expires 9-

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. 0   H   D   0   0   4   1   7   9   4   5   3   0   0   0   0   4		Manifest Document No. 0   0   0   0   4		2. Page 1 of 1		Information in the shaded area is not required by Federal law.					
3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Rd., Cleveland, OH 44124						A. State Manifest Document Number							
4. Generator's Phone (216) 291-7839						B. State Generator's ID							
5. Transporter 1 Company Name LWD Trucking, Inc.			6. US EPA ID Number K   Y   D   9   8   1   4   7   7   8   2   1			C. State Transporter's ID							
7. Transporter 2 Company Name			8. US EPA ID Number			D. Transporter's Phone 502-395-8313							
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029			10. US EPA ID Number K   Y   D   0   8   8   4   3   8   8   1   7			E. State Transporter's ID							
						F. Transporter's Phone							
						G. State Facility's ID							
						H. Facility's Phone 502-395-8313							
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers No. Type		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA9189						0   0   1   D   T		3   6   4   L   1   0		P		D003	
b.													
c.													
d.													
J. Additional Descriptions for Materials Listed Above Soil contaminated with "OTTO" fuel residue. Principle constituent is propylene glycol dinitrate. LWD PC # HR-57						K. Handling Codes for Wastes Listed Above  T06/T07							
15. Special Handling Instructions and Additional Information If transporter is unable to deliver waste to designated facility, he should contact a TRW representative at (216)692-6330 or (713)590-4500.													
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Printed/Typed Name Dennis Tennesfos for TRW Inc.						Signature <i>Dennis Tennesfos for TRW</i>				Month Day Year 09/14/89			
17. Transporter 1 Acknowledgement of Receipt of Materials													
Printed/Typed Name <i>Roger Harper</i>						Signature <i>Roger Harper</i>				Month Day Year 09/14/89			
18. Transporter 2 Acknowledgement of Receipt of Materials													
Printed/Typed Name						Signature				Month Day Year			
19. Discrepancy Indication Space													
Public reporting burden for this collection is estimated to average 37 minutes for generators, 15 minutes for transporters, 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to the Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC.													
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.													
Printed/Typed Name Kean McKinney						Signature <i>Kean McKinney</i>				Month Day Year 09/14/89			

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. 0 H D 0 0 4 1 7 9 4 5 3 0 0 0 0 5		Manifest Document No. 0 0 0 0 5		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.						
3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Rd., Cleveland, OH 44124						A. State Manifest Document Number								
4. Generator's Phone ( 216 )291-7839						B. State Generator's ID								
5. Transporter 1 Company Name LWD Trucking, Inc.			6. US EPA ID Number K Y D 9 8 1 4 7 7 8 2 1			C. State Transporter's ID								
7. Transporter 2 Company Name			8. US EPA ID Number			D. Transporter's Phone								
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029			10. US EPA ID Number K Y D 0 8 8 4 3 8 8 1 7			E. State Transporter's ID								
						F. Transporter's Phone								
						G. State Facility's ID								
						H. Facility's Phone								
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.		
a. <input type="checkbox"/> HM RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA9189						No. Type								
b. <input type="checkbox"/>						0 0 1 D T 4 4 Z 6 C P						D003		
c. <input type="checkbox"/>														
d. <input type="checkbox"/>														
J. Additional Descriptions for Materials Listed Above Soil contaminated with "OTTO" fuel residue. Principle constituent is propylene glycol dinitrate. LWD PC # HR-57						K. Handling Codes for Wastes Listed Above T06/T07								
15. Special Handling Instructions and Additional Information If transporter is unable to deliver waste to designated facility, he should contact a TRW representative at (216)692-6330 or (713)590-4500.														
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Printed/Typed Name Dennis Tennesfos for TRW Inc.					Signature <i>Dennis Tennesfos</i> FOR TRW					Month Day Year 10/4/15/89				
17. Transporter 1 Acknowledgement of Receipt of Materials														
Printed/Typed Name <i>Ty Seal Lunnus</i>					Signature <i>Ty Seal Lunnus</i>					Month Day Year 10/9/15/89				
18. Transporter 2 Acknowledgement of Receipt of Materials														
Printed/Typed Name					Signature					Month Day Year 				
19. Discrepancy Indication Space														
Public reporting burden for this collection is estimated to average: 37 minutes for generators, 15 minutes for transporters, and 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20502.														
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.														
Printed/Typed Name Kean McKinney					Signature <i>Kean McKinney</i>					Month Day Year 10/18/89				

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No.		Manifest Document No.		2. Page 1 of 1		Information in the shaded area is not required by Federal law.	
3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Rd., Cleveland, OH 44124		4. Generator's Phone (216) 291-7839		6. US EPA ID Number K Y D 9 8 1 4 7 7 8 2 1		C. State Transporter's ID		D. Transporter's Phone	
5. Transporter 1 Company Name LWD Trucking, Inc.		7. Transporter 2 Company Name		8. US EPA ID Number		E. State Transporter's ID		F. Transporter's Phone	
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029		10. US EPA ID Number K Y D 0 8 8 4 3 8 8 1 7		12. Containers		13. Total Quantity		14. Unit Wt/Vol	
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)		12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA9189		0 0 1 D T 4 S c d e P		D003					
b.									
c.									
d.									
J. Additional Descriptions for Materials Listed Above Soil contaminated with "OTTO" fuel residue. Principle constituent is propylene glycol dinitrate. LWD PC # HR-57		K. Handling Codes for Wastes Listed Above T06/T07							
15. Special Handling Instructions and Additional Information If transporter is unable to deliver waste to designated facility, he should contact a TRW representative at (216)692-6330 or (713)590-4500.									
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17. Transporter 1 Acknowledgement of Receipt of Materials		Printed/Typed Name B. L. X HARDIN		Signature B. L. X HARDIN		Month Day Year 10/1/5/8			
18. Transporter 2 Acknowledgement of Receipt of Materials		Printed/Typed Name		Signature		Month Day Year			
19. Discrepancy Indication Space		Public reporting burden for this collection is estimated to average: 37 minutes for generators, 15 minutes for transporters, and 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to the Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460		AGENCY DISPLAY OF ESTIMATED BURDEN					
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.		Printed/Typed Name Kean McKinney		Signature Kean McKinney		Month Day Year 10/1/81			

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No.		Manifest Document No.		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.					
3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Rd., Cleveland, OH 44124						A. State Manifest Document Number							
4. Generator's Phone ( 216 ) 291-7839						B. State Generator's ID							
5. Transporter 1 Company Name LWD Trucking, Inc.						C. State Transporter's ID							
6. US EPA ID Number K Y D 9 8 1 4 7 7 8 2 1						D. Transporter's Phone							
7. Transporter 2 Company Name						E. State Transporter's ID							
8. US EPA ID Number						F. Transporter's Phone							
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029						G. State Facility's ID							
10. US EPA ID Number K Y D 0 8 8 4 3 8 8 1 7						H. Facility's Phone							
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers No. Type		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA9189						0 0 1 D T		4 1 9 2 0		P		D003	
b.													
c.													
d.													
J. Additional Descriptions for Materials Listed Above Soil contaminated with "OTTO" fuel residue. Principle constituent is propylene glycol dinitrate. LWD PC # HR-57						K. Handling Codes for Wastes Listed Above  T06/T07							
15. Special Handling Instructions and Additional Information  If transporter is unable to deliver waste to designated facility, he should contact a TRW representative at (216)692-6330 or (713)590-4500.													
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Printed/Typed Name Dennis Tennesfos for TRW Inc.						Signature D. Tennesfos FOR TRW				Month Day Year 10/9/16/81			
17. Transporter 1 Acknowledgement of Receipt of Materials						Signature Bruce Taylor				Month Day Year 10/9/16/81			
18. Transporter 2 Acknowledgement of Receipt of Materials						Signature				Month Day Year			
19. Discrepancy Indication Space						AGENCY DISPLAY OF ESTIMATED BURDEN Public reporting burden for this collection is estimated to average 37 minutes for generators, 15 minutes for transporters, and 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding this burden estimate, including suggestions for reducing this burden, to the Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460.							
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Printed/Typed Name Kean McKinney						Signature Kean McKinney				Month Day Year 10/9/16/81			

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. 0 H D 0 0 4 1 7 9 4 5 3		Manifest Document No. 0 0 0 0 8		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.					
3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Rd., Cleveland, OH 44124						A. State Manifest Document Number							
4. Generator's Phone (216) 291-7839						B. State Generator's ID							
5. Transporter 1 Company Name LWD Trucking, Inc.			6. US EPA ID Number K Y D 9 8 1 4 7 7 8 2 1			C. State Transporter's ID							
7. Transporter 2 Company Name			8. US EPA ID Number			D. Transporter's Phone							
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029			10. US EPA ID Number K Y D 0 8 8 4 3 8 8 1 7			E. State Transporter's ID							
						F. Transporter's Phone							
						G. State Facility's ID							
						H. Facility's Phone							
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA9189						0 0 1 D T		4 1 1 2 2 0		P		D003	
b.													
c.													
d.													
J. Additional Descriptions for Materials Listed Above Soil contaminated with "OTTO" fuel residue. Principle constituent is propylene glycol dinitrate. LWD PC # HR-57						K. Handling Codes for Wastes Listed Above  T06/T07							
15. Special Handling Instructions and Additional Information If transporter is unable to deliver waste to designated facility, he should contact a TRW representative at (216)692-6330 or (713)590-4500.													
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Printed/Typed Name Dennis Tennefos for TRW Inc.						Signature <i>Dennis Tennefos</i>				Month Day Year 09 12 88			
17. Transporter 1 Acknowledgement of Receipt of Materials						Signature <i>Robert Hanks</i>				Month Day Year 09 12 88			
18. Transporter 2 Acknowledgement of Receipt of Materials						Signature				Month Day Year			
Printed/Typed Name						Signature				Month Day Year			
19. Discrepancy Indication Space						<b>AGENCY DISPLAY OF ESTIMATED BURDEN</b> Public reporting burden for this collection is estimated to average: 37 minutes for generators, 15 minutes for transporters, and 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460.							
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.						Signature <i>Kean McKinney</i>				Month Day Year 09 12 88			
Printed/Typed Name Kean McKinney						Signature				Month Day Year			

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. 0   H   D   0   0   4   1   7   9   4   5   3										Manifest Document No. 0   0   0   0   9		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.			
		3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Rd., Cleveland, OH 44124														A. State Manifest Document Number			
4. Generator's Phone ( 216 ) 291-7839														B. State Generator's ID					
5. Transporter 1 Company Name LWD Trucking, Inc.										6. US EPA ID Number K   Y   D   9   8   1   4   7   7   8   2   1				C. State Transporter's ID					
7. Transporter 2 Company Name										8. US EPA ID Number				D. Transporter's Phone					
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029										10. US EPA ID Number K   Y   D   0   8   8   4   3   8   8   1   7				E. State Transporter's ID					
														F. Transporter's Phone 502-395-871					
														G. State Facility's ID					
														H. Facility's Phone					
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)												12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
												No. Type							
a. RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA9189												0   0   1   D   T		43640		P		D003	
b.																			
c.																			
d.																			
J. Additional Descriptions for Materials Listed Above Soil contaminated with "OTTO" fuel residue. Principle constituent is propylene glycol dinitrate. LWD PC # HR-57												K. Handling Codes for Wastes Listed Above  T06/T07							
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Printed/Typed Name Dennis Tennesfor for TRW Inc.												Signature <i>Dennis Tennesfor for TRW</i>				Month Day Year 10   9   2   0   8			
17. Transporter 1 Acknowledgement of Receipt of Materials																			
Printed/Typed Name <i>Billy Hardin</i>												Signature <i>Billy Hardin</i>				Month Day Year 10   9   2   0   8			
18. Transporter 2 Acknowledgement of Receipt of Materials																			
Printed/Typed Name												Signature				Month Day Year 			
<b>AGENCY DISPLAY OF ESTIMATED BURDEN</b>																			
19. Discrepancy Indication Space Public reporting burden for this collection is estimated to average: 37 minutes for generators, 15 minutes for transporters, 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and plating and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to the Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460.																			
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Printed/Typed Name Kean McKinney												Signature <i>Kean McKinney</i>				Month Day Year 10   9   2   0   8			

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. 0   H   D   0   0   4   1   7   9   4   5   3   0   0   0   1   0										Manifest Document No.		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Rd., Cleveland, OH 44124		4. Generator's Phone ( 216 ) 291-7839										A. State Manifest Document Number					
												B. State Generator's ID					
5. Transporter 1 Company Name LWD Trucking, Inc.		6. US EPA ID Number K   Y   D   9   8   1   4   7   7   8   2   1										C. State Transporter's ID					
												D. Transporter's Phone					
7. Transporter 2 Company Name		8. US EPA ID Number										E. State Transporter's ID					
												F. Transporter's Phone 502-395-8313					
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029		10. US EPA ID Number K   Y   D   0   8   8   4   3   8   8   1   7										G. State Facility's ID					
												H. Facility's Phone					
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number) a. <span style="border: 1px solid black; padding: 2px;">RM</span> RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA9189 b. c. d.		12. Containers No. Type		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.									
J. Additional Descriptions for Materials Listed Above Soil contaminated with "OTTO" fuel residue. Principle constituent is propylene glycol dinitrate. LWD PC # HR-57		K. Handling Codes for Wastes Listed Above  T06/T07															
15. Special Handling Instructions and Additional Information If transporter is unable to deliver waste to designated facility, he should contact a TRW representative at (216)692-6330 or (713)590-4500.																	
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Printed/Typed Name Dennis Tennesfos for TRW Inc.						Signature <i>Dennis Tennesfos for TRW</i>				Month Day Year 09/20/81							
17. Transporter 1 Acknowledgement of Receipt of Materials																	
Printed/Typed Name <i>Kerry W. Crider</i>						Signature <i>Kerry W. Crider</i>				Month Day Year 09/22/81							
18. Transporter 2 Acknowledgement of Receipt of Materials																	
Printed/Typed Name						Signature				Month Day Year 							
19. Discrepancy Indication Space <b>AGENCY DISPLAY OF ESTIMATED BURDEN</b> Public reporting burden for this collection is estimated to average 37 minutes for generators, 15 minutes for transporters, and 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460.																	
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Printed/Typed Name Kean McKinney						Signature <i>Kean McKinney</i>				Month Day Year 11/9/81							

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. 0 H D 0 0 4 1 7 9 4 5 3 0 0 0 1 1										Manifest Document No. 0 0 0 1 1		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.					
		3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Rd., Cleveland, OH 44124														A. State Manifest Document Number		B. State Generator's ID			
4. Generator's Phone ( 216 ) 291-7839														C. State Transporter's ID		D. Transporter's Phone		E. State Transporter's ID		F. Transporter's Phone	
5. Transporter 1 Company Name LWD Trucking, Inc.														6. US EPA ID Number K Y D 9 8 1 4 7 7 8 2 1		G. State Facility's ID		H. Facility's Phone			
7. Transporter 2 Company Name														8. US EPA ID Number							
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029														10. US EPA ID Number K Y D 0 8 8 4 3 8 8 1 7							
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)														12. Containers No. Type		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. <span style="border: 1px solid black; padding: 2px;">HM</span> RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA9189														0 0 1 D T		4 3 1 2 0		P		D003	
b.																					
c.																					
d.																					
J. Additional Descriptions for Materials Listed Above Soil contaminated with "OTTO" fuel residue. Principle constituent is propylene glycol dinitrate. LWD PC # HR-57														K. Handling Codes for Wastes Listed Above  T06/T07							
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Printed/Typed Name Dennis Tennesfos for TRW Inc.										Signature <i>Dennis Tennesfos</i>				Month Day Year 10/9/2008							
17. Transporter 1 Acknowledgement of Receipt of Materials																					
Printed/Typed Name <i>W. Caraway</i>										Signature <i>W. Caraway</i>				Month Day Year 10/9/2008							
18. Transporter 2 Acknowledgement of Receipt of Materials																					
Printed/Typed Name										Signature				Month Day Year							
19. Discrepancy Indication Space <b>AGENCY DISPLAY OF ESTIMATED BURDEN</b> Public reporting burden for this collection is estimated to average 37 minutes for generators, 15 minutes for transporters, and 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to the Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460.																					
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.																					
Printed/Typed Name KEAN McKinney										Signature <i>K. McKinney</i>				Month Day Year 10/12/08							

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No.		Manifest Document No.		2. Page 1 of		Information in the shaded areas is not required by Federal law.					
3. Generator's Name and Mailing Address TRW, Inc. 1900 Richmond Rd, CLEVELAND, OH. 44124						A. State Manifest Document Number							
4. Generator's Phone ( )						B. State Generator's ID							
5. Transporter 1 Company Name LWD Trucking, Inc.				6. US EPA ID Number KY10981477821		C. State Transporter's ID							
7. Transporter 2 Company Name				8. US EPA ID Number		D. Transporter's Phone (502) 395-8313							
9. Designated Facility Name and Site Address LWD, Inc. Hwy 1523 CAVERT City, KY 42029				10. US EPA ID Number KY100884388117		E. State Transporter's ID							
						F. Transporter's Phone							
						G. State Facility's ID							
						H. Facility's Phone (502) 395-8313							
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. <input type="checkbox"/> HM						No. Type							
b. <input type="checkbox"/> NA9189 RQ-HAZARDOUS WASTE SOLID, NQS, ORM-E, 001 DIT 413060 P D003													
c. <input type="checkbox"/>													
d. <input type="checkbox"/>													
J. Additional Descriptions for Materials Listed Above SOIL CONTAMINATED WITH "OTTO" FUEL RESIDUE. PRINCIPLE CONSTITUENT IS PROPYLENE GLYCOL DINITRATE. LWD PC # HR-57						K. Handling Codes for Wastes Listed Above T06/T07							
15. Special Handling Instructions and Additional Information If TRANSPORTER IS UNABLE TO DELIVER WASTE TO DESIGNATED FACILITY, HE SHOULD CONTACT A TRW REPRESENTATIVE AT (216) 692-6330 OR (713) 590-4500													
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.													
Printed/Typed Name DENNIS TENNESSEE FOR TRW INC						Signature Dennis Tennessee FOR TRW				Month Day Year 10/9/27/89			
17. Transporter 1 Acknowledgement of Receipt of Materials													
Printed/Typed Name WAYNE CRAWLEY						Signature Wayne Crawley				Month Day Year 10/9/27/89			
18. Transporter 2 Acknowledgement of Receipt of Materials													
Printed/Typed Name						Signature				Month Day Year			
19. Discrepancy Indication Space Change per Mary Ann M. Call 9-29-89, BH													
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.													
Printed/Typed Name Kean McKinney						Signature Kean McKinney				Month Day Year 10/9/27/89			

## AGENCY DISPLAY OF ESTIMATED BURDEN

The reporting burden for this collection is estimated to average: 37 minutes for generators, 15 minutes for transporters, and 1 minute for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding this burden estimate, including suggestions for reducing this burden, to:

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. OH D 0104117943500113		Manifest Document No. OCT 3 1989		2. Page 1 of		Information in the shaded areas is not required by Federal law.					
3. Generator's Name and Mailing Address TRW INC. 1900 RICHMOND RD, CLEVELAND, OH 44124						A. State Manifest Document Number							
4. Generator's Phone ( )						B. State Generator's ID							
5. Transporter 1 Company Name LWD TRUCKING, INC.				6. US EPA ID Number KY D 91811477821		C. State Transporter's ID							
7. Transporter 2 Company Name				8. US EPA ID Number		D. Transporter's Phone							
9. Designated Facility Name and Site Address LWD, INC. HWY 1523 CALVERT CITY, KY 42024				10. US EPA ID Number KY D 0194413183117		E. State Transporter's ID							
						F. Transporter's Phone							
						G. State Facility's ID							
						H. Facility's Phone							
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. <input type="checkbox"/> HM RQ-HAZARDOUS WASTE SOLID, N.O.S., ORM-E, NA9139						0101 D T 425110 P						0003	
b.													
c.													
d.													
J. Additional Descriptions for Materials Listed Above SOIL CONTAMINATED WITH "OTTO" FUEL RESIDUE PRINCIPLE CONSTITUENT IS PROPYLENE GLYCOL DINITRATE. LWD PC# HR-57						K. Handling Codes for Wastes Listed Above T06/T07							
15. Special Handling Instructions and Additional Information IF TRANSPORTER IS UNABLE TO DELIVER WASTE TO DESIGNATED FACILITY, HE SHOULD CONTACT A TRW REPRESENTATIVE AT (216) 612-6330 OR (713) 540-4500.													
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.													
Printed/Typed Name DENNIS TENNETER for TRW, INC.					Signature Dennis Tenneter for TRW			Month Day Year 10/9/27/89					
17. Transporter 1 Acknowledgement of Receipt of Materials													
Printed/Typed Name JOHNNY K. KEELING					Signature Johnny K. Keeling			Month Day Year 10/9/27/89					
18. Transporter 2 Acknowledgement of Receipt of Materials													
Printed/Typed Name					Signature			Month Day Year					
19. Discrepancy Indication Space													
<p style="text-align: center;"><b>AGENCY DISPLAY OF ESTIMATED BURDEN</b></p> <p>Public reporting burden for this collection is estimated to average: 37 minutes for generators, 15 minutes for transporters, and 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20503.</p>													
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.													
Printed/Typed Name Kean McKinney					Signature Kean McKinney			Month Day Year 10/9/27/89					

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. OH100041179453100014		Manifest Document No.		2. Page 1 of 1		Information in the shaded area is not required by Federal law.	
3. Generator's Name and Mailing Address TRW INC 900 RICHMOND RD. CLEVELAND, OH. 44124						A. State Manifest Document Number			
4. Generator's Phone ( )						B. State Generator's ID			
5. Transporter 1 Company Name LWD TRUCKING, INC				6. US EPA ID Number KY101981477821		C. State Transporter's ID			
7. Transporter 2 Company Name				8. US EPA ID Number		D. Transporter's Phone			
9. Designated Facility Name and Site Address LWD, INC. HWY 1523 CHUBB CITY, KY. 42029						10. US EPA ID Number KY1010984388117		E. State Transporter's ID	
								F. Transporter's Phone	
								G. State Facility's ID	
								H. Facility's Phone	
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity	
						No. Type		Unit Wt/Vol	
a. RM RQ-HAZARDOUS WASTE SOLID, N.O.S., ORM-E, NA9189						0101 DT		42960	
b.									
c.									
d.									
J. Additional Descriptions for Materials Listed Above SOIL CONTAMINATED WITH "OTTO" FUEL RESIDUE PRINCIPAL CONSTITUENT IS PROPYLENE GLYCOL DINITRATE LWD PC # HR-57						K. Handling Codes for Wastes Listed Above T06/T07			
15. Special Handling Instructions and Additional Information IF TRANSPORTER IS UNABLE TO DELIVER WASTE TO DESIGNATED FACILITY, HE SHOULD CONTACT A TRW REPRESENTATIVE AT (216) 692-6330 OR (713) 590-4500.									
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.									
Printed/Typed Name DENNIS TENNEFOS FOR TRW, INC.						Signature Dennis Tennefos FOR TRW		Month Day Year 11/01/88	
17. Transporter 1 Acknowledgement of Receipt of Materials						Printed/Typed Name ROGER L. CROFT		Signature Roger L. Croft	
								Month Day Year 11/01/88	
18. Transporter 2 Acknowledgement of Receipt of Materials						Printed/Typed Name		Signature	
								Month Day Year	
19. Discrepancy Indication Space Correct EPA waste # put in line # per Mark Osterman of TR									
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.									
Printed/Typed Name Kean McKinney						Signature Kean McKinney		Month Day Year 11/04/88	

## AGENCY DISPLAY OF ESTIMATED BURDEN

The reporting burden for this collection is estimated to average 37 minutes for generators, 15 minutes for transporters, and 15 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to:

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No.		Manifest Document No.		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.											
3. Generator's Name and Mailing Address TRW, INC. 1900 Richmond Rd., CLEVELAND, OH. 44124						A. State Manifest Document Number													
4. Generator's Phone (216) 291-7839						B. State Generator's ID													
5. Transporter 1 Company Name LWD TRUCKING, INC.				6. US EPA ID Number KYD098114778211		C. State Transporter's ID													
7. Transporter 2 Company Name				8. US EPA ID Number		D. Transporter's Phone 502-395-8311													
9. Designated Facility Name and Site Address LWD, Trucking INC. Hwy - 523 CANTON CITY, KY. 42029				10. US EPA ID Number KYD0884388117		E. State Transporter's ID													
						F. Transporter's Phone													
						G. State Facility's ID													
						H. Facility's Phone													
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.							
a. RC - HAZARDOUS WASTE SOLID; N.O.S., ORM - E, NA 9189						No. Type		44160				D003							
b.																			
c.																			
d.																			
J. Additional Descriptions for Materials Listed Above SOIL CONTAMINATED WITH "OTTO" FUEL RESIDUE. PRINCIPAL CONSTITUENT IS PROPYLENE GLYCOL DINITRATE LWD PC # HR-51						K. Handling Codes for Wastes Listed Above T06/T07													
15. Special Handling Instructions and Additional Information If TRANSPORTER IS UNABLE TO DELIVER WASTE TO DESIGNATED FACILITY, HE SHALL CONTACT A TRW REPRESENTATIVE AT (216) 692-6330 OR (713) 590-4500																			
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.																			
Printed/Typed Name DENNIS TRUMBLES FOR TRW INC.					Signature Dennis Trumbles FOR TRW					Month Day Year 11/01/21									
17. Transporter 1 Acknowledgement of Receipt of Materials					Printed/Typed Name BILLY HARDIN					Signature Billy Hardin					Month Day Year 11/01/21				
18. Transporter 2 Acknowledgement of Receipt of Materials					Printed/Typed Name					Signature					Month Day Year				
19. Discrepancy Indication Space Correct EPA Waste # put in per Mark Osterman of TRW SY																			
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.																			
Printed/Typed Name Kean McKinney					Signature Kean McKinney					Month Day Year 11/04/21									

## AGENCY DISPLAY OF ESTIMATED BURDEN

Public reporting burden for this collection is estimated to average: 37 minutes for generators, 15 minutes for transporters, and 0 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to: Washington, DC 20503

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. 0 H D 0 0 4 1 7 9 4 5 3 0 0 0 1 6		Manifest Document No. 0 0 0 1 6		2. Page 1 of		Information in the shaded areas is not required by Federal law.					
3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Road, Cleveland, OH 44124						A. State Manifest Document Number							
						B. State Generator's ID							
4. Generator's Phone (216) 289-7839						C. State Transporter's ID							
5. Transporter 1 Company Name LWD Trucking, Inc.						D. Transporter's Phone 502-395-8313							
6. US EPA ID Number K Y D 9 8 1 4 7 7 8 2 1						E. State Transporter's ID							
7. Transporter 2 Company Name						F. Transporter's Phone							
8. US EPA ID Number						G. State Facility's ID							
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029						H. Facility's Phone 502-395-8313							
10. US EPA ID Number K Y D 0 8 8 4 3 8 8 1 7													
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA 9189						No. Type 0 0 1 D T		4 7 8 0 0		P		D003	
b.													
c.													
d.													
J. Additional Descriptions for Materials Listed Above Soils, Gravel and Solids Contaminated with "Otto Fuel" Residue. Principle Constituent is Propylene Glycol Dinitrate. LWD PC #HR-57						K. Handling Codes for Wastes Listed Above T06/T07							
15. Special Handling Instructions and Additional Information If transporter is unable to deliver waste to designated facility he should contact a TRW representative at (216) 692-6330 or (713) 590-4500. Billing Address: TRW E.S., 15311 Vantage Pkwy. West, Suite 300, Houston, TX 77032													
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.													
Printed/Typed Name John Stewart/ for TRW Inc.					Signature <i>John Stewart</i> For TRW.			Month Day Year 1 2 0 7 8					
17. Transporter 1 Acknowledgement of Receipt of Materials													
Printed/Typed Name <i>Joe Moreland</i>					Signature <i>Joe Moreland</i>			Month Day Year 1 2 0 7 8					
18. Transporter 2 Acknowledgement of Receipt of Materials													
Printed/Typed Name					Signature			Month Day Year					
19. Discrepancy Indication Space													
Public reporting burden for this collection is estimated to average: 37 minutes for generators, 15 minutes for transporters, and 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20503													
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.													
Printed/Typed Name Kean McKinney					Signature <i>Kean McKinney</i>			Month Day Year 1 2 0 8 8					

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. 0 H D 0 0 4 1 7 9 4 5 3 0 0 0 0 1		Manifest Document No.		2. Page 1 of 1		Information in the shaded area is not required by Federal law					
3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond Road, Cleveland OH 44124						A. State Manifest Document Number							
4. Generator's Phone ( 216 ) 291-7839						B. State Generator's ID							
5. Transporter 1 Company Name LWD Trucking, Inc.				6. US EPA ID Number K Y D 9 8 1 4 7 7 8 2 1		C. State Transporter's ID							
7. Transporter 2 Company Name				8. US EPA ID Number		D. Transporter's Phone 502-395-8311							
9. Designated Facility Name and Site Address LWD, Inc. Hwy. 1523 Calvert City, KY 42029				10. US EPA ID Number K Y D 0 8 8 4 3 8 8 1 7		E. State Transporter's ID							
						F. Transporter's Phone							
						G. State Facility's ID							
						H. Facility's Phone 502-395-8311							
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. Decontamination Water & Storm Water, Non-Hazardous						0 0 1 T T		4 2 1 1 4 0		P		N/A	
b.													
c.													
d.													
J. Additional Descriptions for Materials Listed Above Decontamination Water and Storm Water from "Otto Fuel" Remediation Project. LWD PC# HS-89						K. Handling Codes for Wastes Listed Above							
15. Special Handling Instructions and Additional Information If unable to deliver to designated facility, contact TRW representative at (216)692-633 or (713)590-4500. Billing Address: TRW E.S., 15311 Vantage Pkwy.W., #300, Houston, TX 77032													
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined is economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present or future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and use the best waste management method that is available to me and that I can afford.													
Printed/Typed Name John Stewart/ for TRW Inc.						Signature <i>John Stewart for TRW</i>				Month Day 1 2 0 6			
17. Transporter 1 Acknowledgement of Receipt of Materials													
Printed/Typed Name LARRY E. BEARD						Signature <i>Larry E. Beard</i>				Month Day 1 2 0 6			
18. Transporter 2 Acknowledgement of Receipt of Materials													
Printed/Typed Name						Signature				Month Day 1 1 1 1			
19. Discrepancy Indication Space Public reporting burden for this collection is estimated to average 37 minutes for generators, 15 minutes for transporters and 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to Washington, DC: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC: 20460													
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.													
Printed/Typed Name Kean McKinney						Signature <i>Kean McKinney</i>				Month Day 1 2 8			

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. 08D004179453000001		Manifest Document No. 2 of 1		2. Page 1 Information in the shaded area is not required by Federal law.	
3. Generator's Name and Mailing Address TRW Inc. 1900 Richmond, Cleveland, OH 44124 4. Generator's Phone (216) 291-7839				A. State Manifest Document Number			
5. Transporter 1 Company Name LWD Trucking, Inc.				6. US EPA ID Number KYD981477821		C. State Transporter's ID	
7. Transporter 2 Company Name				8. US EPA ID Number		D. Transporter's Phone 502-395-8313	
9. Designated Facility Name and Site Address LWD, Inc. Hwy 1523 Calvert City, KY 42029				10. US EPA ID Number KYD088438817		E. State Transporter's ID	
						F. Transporter's Phone	
						G. State Facility's ID	
						H. Facility's Phone 502-395-8313	
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)				12. Containers		13. Total Quantity	
a. RM RQ-Hazardous Waste Solid, n.o.s., ORM-E, NA 9189				No. Type 001 D T		P	
b.						F001, F005, D001	
c.							
d.							
J. Additional Descriptions for Materials Listed Above Blocks of Oak Wood Flooring Treated with Preservatives. Trace Metals Detected. LWD PC #HS-41				K. Handling Codes for Wastes Listed Above T06/T07			
15. Special Handling Instructions and Additional Information * Land disposal restrictions notification attached. If unable to deliver to designated facility contact TRW representative at (216)692-6330 or (713)590-4500. Billing Address: TRW E.S., 15311 Vantage Pkwy. West, Suite 300, Houston, TX 77032							
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.							
Printed/Typed Name John Stewart/ for TRW Inc.				Signature <i>John Stewart</i> FOR TRW		Month Day Year 1/20/88	
17. Transporter 1 Acknowledgement of Receipt of Materials				Signature <i>Billy Harden</i>		Month Day Year 1/20/88	
Printed/Typed Name BILLY HARDEN				Signature		Month Day Year	
18. Transporter 2 Acknowledgement of Receipt of Materials				Signature		Month Day Year	
Printed/Typed Name				Signature		Month Day Year	
19. Discrepancy Indication Space * Change Item (1) per Gary Griesenbeck 12-11-89 MD							
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.							
Printed/Typed Name Kean McKinney				Signature <i>Kean McKinney</i>		Month Day Year 1/21/88	

## AGENCY DISPLAY OF ESTIMATED BURDEN

Public reporting burden for this collection is estimated to average 37 minutes for generators, 15 minutes for transporters, and 15 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to Washington, DC 20503.

## LAND DISPOSAL RESTRICTIONS NOTIFICATION

Generator Name: TRW INC.EPA ID Number: OH D004179-453Address: 1900 RICHMOND RD., CLEVELAND, OHIO  
44124

\* Received 12-8-87

Under manifest number 00002 we are shipping to you, for storage, treatment, or disposal, a waste stream classified by EPA Hazardous Waste Number(s): F001, F002, F005, D008. This stream contains the following constituents and must be treated at least to the level specified below. This waste appears not to meet land disposal ban guidelines per 40 CFR 268.

F001-F005 Spent Solvents	Concentration (in mg/l)
Acetone.....	0.59
n-Butyl alcohol.....	5.0
Carbon disulfide.....	4.81
Carbon tetrachloride.....	0.96
Chorobenzene.....	0.05
Cresols (and cresylic acid).....	0.75
Cyclohexanone.....	0.75
1,2 - dichlorobenzene.....	0.125
Ethyl acetate.....	0.75
Ethyl benzene.....	0.053
Ethyl ether.....	0.75
Isobutanol.....	5.0
Methanol.....	0.75
Methylene chloride.....	0.96
Methylene chloride*	
*(from the pharmaceutical industry).....	0.96
X Methyl ethyl ketone.....	0.75
Methyl isobutyl ketone.....	0.33
Nitrobenzene.....	0.125
Pyridine.....	0.33
X Tetrachloroethylene.....	0.05
Toluene.....	0.33
X 1,1,1 - Trichloroethane.....	0.41
1,1,2 - Trichloro-1,2,2, trifluoroethane....	0.96
X Trichloroethylene.....	0.091
Trichlorofluoromethane.....	0.96
Xylene.....	0.15

The preceding constituent composition is based upon, an attached waste analysis or X my best knowledge of the waste system.

I hereby certify that all information submitted in this and all associated documents is complete and accurate to the best of my knowledge and information.

Authorized representative signature Mark C OstermanPrint or Type Name MARK C OSTERMANTitle QA ENGRDate 10/19/89

DEC 14 1989

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. 0 H D 0 0 4 1 7 9 4 5 3 0 0 0 0 1		Manifest Document No. 0 0 0 0 0 1		2. Page 1 of 1		Information in the shaded area is not required by Federal law					
3. Generator's Name and Mailing Address TRW INC. 1900 RICHMOND ROAD, CLEVELAND, OH. 44124						A. State Manifest Document Number							
4. Generator's Phone (216) 291-7839						B. State Generator's ID							
5. Transporter 1 Company Name DART TRUCKING				6. US EPA ID Number 0 H D 0 0 9 8 6 5 8 2 5		C. State Transporter's ID							
7. Transporter 2 Company Name				8. US EPA ID Number		D. Transporter's Phone 216-533-9							
9. Designated Facility Name and Site Address LWD. INC HWY 1523 CALVERT CITY, KY 42029				10. US EPA ID Number K Y D 0 8 8 4 3 8 8 1 7		E. State Transporter's ID							
						F. Transporter's Phone							
						G. State Facility's ID							
						H. Facility's Phone (502)-395-8313							
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. RM-HAZARDOUS WASTE SOLID, NOS., ORM-E, NA 9189						0 0 2 D F		0 0 1 1 1 0		G		D 003	
b. NON HAZARDOUS STEEL TANK PIECES						0 0 4 D M		0 0 2 2 2 0		G		N/A	
c. RM, HAZARDOUS WASTE SOLID, NOS., ORM-E, NA 9189						0 0 8 D M		0 0 4 4 4 0		G		D 003	
d.													
J. Additional Descriptions for Materials Listed Above: A CARBON FILTER DRUMS, CONTAMINATED WITH OTTO FUEL PC#HR57 B DECONTAMINATED STEEL TANK PIECES, PC#HT 14 C GRAVEL & SAND CONTAMINATED WITH OTTO FUEL PC#HR57						K. Handling Codes for Wastes Listed Above: T06/T07							
15. Special Handling Instructions and Additional Information DO NOT DRY CARBON BEFORE INCINERATION. IF TRANSPORTER IS UNABLE TO DELIVER WASTE TO DESIGNATED FACILITY, CONTACT TRW REPRESENTATIVE AT (216) 692-6330 OR (713) 590-4500													
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present or future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and use the best waste management method that is available to me and that I can afford.													
Printed/Typed Name JOHN STEWART FOR TRW INC.						Signature John Stewart For TRW				Month Day 11/2/08			
17. Transporter 1 Acknowledgement of Receipt of Materials													
Printed/Typed Name J. Buehman						Signature J. Buehman				Month Day 11/2/08			
18. Transporter 2 Acknowledgement of Receipt of Materials													
Printed/Typed Name						Signature				Month Day 11/11/08			
19. Discrepancy Indication Space						AGENCY DISPLAY OF ESTIMATED BURDEN Public reporting burden for this collection is estimated to average 37 minutes for generators, 15 minutes for transporters, 10 minutes for treatment, storage and disposal facilities. This includes time for reviewing instructions, gathering data, and performing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to the Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460.							
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.													
Printed/Typed Name Steve York						Signature Steve York				Month Day 11/2/08			



American Abatement and  
Asbestos Removal Corporation

3723 Pearl Road • Cleveland, Ohio 44109

216/741-9150

WASTE MANIFEST

Name of Carrier: New Era Trucking, Inc.

Manifest Document No: \_\_\_\_\_

Shipper No: \_\_\_\_\_

Carrier No: (OHD-986971414)

IDENTIFICATION:

Generator (Owner of building where asbestos waste was generated):

Name: T.R.W., Inc. (Building #49) CARE of TRW Environmental S.

Mailing Address: 15311 Vantage Parkway, West, Suite 300, Houston, TX 77032

Telephone No: 713/590-4500

Packer (Entity of company or organization packaging asbestos waste for shipping):

Name: American Abatement and Asbestos Removal Corporation

Mailing Address: 3723 Pearl Road, Cleveland, OH 44109

Telephone No: 216/741-9150

Transporter (Entity of company or organization transporting asbestos waste):

Name: New Era Trucking, Inc.

Mailing Address: P.O. Box 330, North Ridgeville, OH 44039-0330

Telephone No: 216/779-8273

TSDF Facility (Licensed dump site):

Name: S & S Landfill

Mailing Address: Route 5, Box 559, Clarksburg, WV 26301

Telephone No: 304/745-3234

WASTE INFORMATION:

Number	Container Type	Description and Classification	Floor/Room
<u>7</u>	<u>Drums</u>	RQ Hazardous Substance, Solid	<u>Bldg 49</u>
	Bags	NOS (asbestos) ORM-E, NA-9188	

SPECIAL INSTRUCTIONS AND/OR COMMENTS:

All materials to be adequately wetted - double bagged - sealed in fibre/steel drums DOT-EPA marked.

CERTIFICATION SIGNATURES:

Generator: [Signature] Date: 11/14/89

Packer: [Signature] Date: 11/14/89

Transporter: [Signature] Date: \_\_\_\_\_

TSDF: [Signature] Date: 11-22-89

Original shall be returned to Generator and copies shall be returned to the Packer, Transporter and the TSDF. This is a five (5) part document.



American Abatement and  
Asbestos Removal Corporation

3723 Pearl Road • Cleveland, Ohio 44109

216/741-9150

WASTE MANIFEST

Name of Carrier: New Era Trucking, Inc.

Manifest Document No: \_\_\_\_\_

Shipper No: \_\_\_\_\_

Carrier No: \_\_\_\_\_ (OHD 986971414)

IDENTIFICATION:

Generator (Owner of building where asbestos waste was generated):

Name: T.R.W., Inc. (Building #49) <sup>IN CARE of TRW Environmental Svcs</sup>  
Mailing Address: 15311 Vantage Parkway, West, Suite 300, Houston, TX 77032  
Telephone No: 713/590-4500

Packer (Entity of company or organization packaging asbestos waste for shipping):

Name: American Abatement and Asbestos Removal Corporation  
Mailing Address: 3723 Pearl Road, Cleveland, OH 44109  
Telephone No: 216/741-9150

Transporter (Entity of company or organization transporting asbestos waste):

Name: New Era Trucking, Inc.  
Mailing Address: P.O. Box 330, North Ridgeville, OH 44039-0330  
Telephone No: 216/779-8273

TSDF Facility (Licensed dump site):

Name: S & S Landfill  
Mailing Address: Route 5, Box 559, Clarksburg, WV 26301  
Telephone No: 304/745-3234

WASTE INFORMATION:

Number	Container Type	Description and Classification	Floor/Room
6	Drums	RQ Hazardous Substance, Solid	Bldg 49
	Bags	NOS (asbestos) ORM-E, NA-9188	

SPECIAL INSTRUCTIONS AND/OR COMMENTS:

All materials to be adequately wetted - double bagged - sealed in fibre/steel drums DOT-EPA marked.

CERTIFICATION SIGNATURES:

Generator: W. Tennessee FOR TRW Date: 11/15/89  
Packer: Ben A. Brown Date: 11/15/89  
Transporter: Bill Bandy Date: \_\_\_\_\_  
TSDF: Carla Thiley Date: 11-22-89

Original shall be returned to Generator and copies shall be returned to the Packer, Transporter and the TSDF. This is a five (5) part document.

## WASTE RECORD/RECEIPT

PHOTO COPY

S &amp; S Landfill For

13 DRUMS

Route 5, Box 559, Clarksburg, WV 26301  
304/745-3234

To comply with OAC 3745-27-08(M), all relevant information must be provided

Date: 11/22/89 Time In: \_\_\_\_\_ Time Out: \_\_\_\_\_Name of  
Hauler: New Era Trucking, Inc.Address: P.O. Box 330, North Ridgeville, OH 44039-0330Telephone: 216/779-8273 Driver: \_\_\_\_\_

License of Vehicle: \_\_\_\_\_

Type of Waste: (circle) Residential Municipal Commercial Industrial Asbestos  
Agricultural Mining Other (specify) \_\_\_\_\_

Amount of Waste: Yds \_\_\_\_\_ Tons \_\_\_\_\_ (attach weight slip)

Waste Generator: (if commercial or residential route, note it)

Name: Various (See Attached)

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Tipping Fees: \_\_\_\_\_ Cash \_\_\_\_\_ Credit \_\_\_\_\_

Source of Waste: City or County Cuyahoga State Ohio

COMPANY TO BILL FOR TIPPING FEES: \_\_\_\_\_

The undersigned certifies that the material disposed of at the S & S Landfill

as noted above is non-hazardous solid waste as defined by the Ohio Revised Code and Ohio Administrative Code.

If the waste material has been specifically approved for acceptance at this landfill by the submission of chemical analysis or other laboratory data, it is certified that this material conforms with the samples analyzed. If the waste material is asbestos, it is certified that the material has been properly packaged, labeled, and transported, and that the hauler will hold the landfill harmless from all claims, fines or penalties imposed upon the landfill operator for and violation of law or regulations for improper transportation, packaging, labeling or handling, prior to being put into the possession of the landfill operator.

All parties disposing of any waste at this landfill agree to fully indemnify the landfill operator for any and all claims, fines or penalties, including clean up costs, engineering fees and claims of any third parties, which may be caused, either directly or indirectly, by those parties bringing in waste materials to the landfill which are not permitted to be disposed of at this facility by limitations in any landfill permits or by the Ohio Solid Waste Laws and Regulations.

Bill Buntz  
TransportorCarla Riley  
Landfill Representative11-22-89  
DateAmerican Abatement and  
Asbestos Removal Corporation

3723 Pearl Road ■ Cleveland, Ohio 44109

216/741-9150



American Abatement and  
Asbestos Removal Corporation

3723 Pearl Road • Cleveland, Ohio 44109

216/741-9150

WASTE MANIFEST

Name of Carrier: New Era Trucking, Inc.

Manifest Document No: \_\_\_\_\_

Shipper No: \_\_\_\_\_

Carrier No: (OHD-986971414)

IDENTIFICATION:

Generator (Owner of building where asbestos waste was generated):

Name: T.R.W., Inc. (Building #49), c/o T.R.W. Environmental Services

Mailing Address: 15311 Vantage Parkway, West, Suite 300, Houston, TX 77032

Telephone No: 713/590-4500

Packer (Entity of company or organization packaging asbestos waste for shipping):

Name: American Abatement and Asbestos Removal Corporation

Mailing Address: 3723 Pearl Road, Cleveland, OH 44109

Telephone No: 216/741-9150

Transporter (Entity of company or organization transporting asbestos waste):

Name: New Era Trucking, Inc.

Mailing Address: P.O. Box 330, North Ridgeville, OH 44039-0330

Telephone No: 216/779-8273

TSDF Facility (Licensed dump site):

Name: S & S Landfill

Mailing Address: Route 5, Box 559, Clarksburg, WV 26301

Telephone No: 304/745-3234

WASTE INFORMATION:

Number	Container Type	Description and Classification	Floor/Room
153	Drums (Bags) <i>NOP FRIABLE</i>	RQ Hazardous Substance, Solid NOS (asbestos) ORM-E, NA-9188 <i>Roofing tiles + ducts</i>	<i>Bld 49</i>

SPECIAL INSTRUCTIONS AND/OR COMMENTS:

All materials to be adequately wetted - double bagged - sealed in fibre/steel drums DOT-EPA marked.

CERTIFICATION SIGNATURES:

Generator: *[Signature]* FOR TRW. Date: \_\_\_\_\_

Packer: *[Signature]* Date: 11/27/89

Transporter: *[Signature]* Date: 11-28-89

TSDF: *[Signature]* Date: 11-29-89

Original shall be returned to Generator and copies shall be returned to the Packer, Transporter and the TSDF. This is a five (5) part document.

WASTE RECORD/RECEIPT

153 BAGS  
COPY

For  
S & S Landfill  
Route 5, Box 559, Clarksburg, WV 26301  
304/745-3234

To comply with OAC 3745-27-08(M), all relevant information must be provided

Date: 11/29/89 Time In: Time Out:  
Name of  
Hauler: New Era Trucking, Inc.  
Address: P.O. Box 330, North Ridgeville, OH 44039-0330  
Telephone: 216/779-8273 Driver:  
License of Vehicle:  
Type of Waste: (circle) Residential Municipal Commercial Industrial Asbestos  
Agricultural Mining Other (specify)  
Amount of Waste: Yds Tons (attach weight slip)  
Waste Generator: (if commercial or residential route, note it)  
Name: T.R.W., Inc. (Building #49), c/o TRW Environmental Services  
Address: 15311 Vantage Parkway, West, Suite 300, Houston, TX 77032  
Telephone: 713/590-4500 Tipping Fees: Cash Credit  
Source of Waste: City or County Cuyahoga State Ohio  
COMPANY TO BILL FOR TIPPING FEES:  
The undersigned certifies that the material disposed of at the  
S & S Landfill as noted above is non-hazardous solid  
waste as defined by the Ohio Revised Code and Ohio Administrative Code.

If the waste material has been specifically approved for acceptance at this landfill by the submission of chemical analysis or other laboratory data, it is certified that this material conforms with the samples analyzed. If the waste material is asbestos, it is certified that the material has been properly packaged, labeled, and transported, and that the hauler will hold the landfill harmless from all claims, fines or penalties imposed upon the landfill operator for and violation of law or regulations for improper transportation, packaging, labeling or handling, prior to being put into the possession of the landfill operator.

All parties disposing of any waste at this landfill agree to fully indemnify the landfill operator for any and all claims, fines or penalties, including clean up costs, engineering fees and claims of any third parties, which may be caused, either directly or indirectly, by those parties bringing in waste materials to the landfill which are not permitted to be disposed of at this facility by limitations in any landfill permits or by the Ohio Solid Waste Laws and Regulations.

Randy Teter  
Transporter  
Calvin Riley  
Landfill Representative  
11-29-89  
Date



American Abatement and  
Asbestos Removal Corporation

3723 Pearl Road ■ Cleveland, Ohio 44109

216/741-9150

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. 01H1D00417945300000		Manifest Document No. 1		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.					
3. Generator's Name and Mailing Address TRW Incorporated (care of Mr. Andrew L. Resetar) 1900 Richmond Road, Cleveland, Ohio 44124						A. State Manifest Document Number							
4. Generator's Phone (216) 291-7839						B. State Generator's ID							
5. Transporter 1 Company Name Clean Harbors of Kingston						C. State Transporter's ID							
6. US EPA ID Number N1A1D039322250						D. Transporter's Phone (617) 849-1800							
7. Transporter 2 Company Name						E. State Transporter's ID							
8. US EPA ID Number						F. Transporter's Phone							
9. Designated Facility Name and Site Address Clean Harbors of Cleveland, Incorporated 2900 Broadway, Cleveland, Ohio 44115						G. State Facility's ID							
10. US EPA ID Number 01H1D000724153						H. Facility's Phone 216-429-2401							
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)						12. Containers No. Type		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
a. Non-Hazardous per existing Federal Hazardous Waste Management Regulations (Resource Conservation and Recovery Act)...Water from cleaning activities.						0101 T T		00350		G		not applicable	
b.													
c.													
d.													
J. Additional Descriptions for Materials Listed Above Considered a special waste by the Ohio Environmental Protection Agency per the Building 45 Closure Plan. Clean Harbor tracking number is CLV7588. Profile Number is R52706.						K. Handling Codes for Wastes Listed Above							
15. Special Handling Instructions and Additional Information If unable to deliver to designated facility, contact TRW representative at (713) 590-4500. Billing address: TRW E.S., 15311 Vantage Parkway, Suite 300, Houston, Texas 77032													
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment, OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.													
Printed/Typed Name On Behalf of TRW INC. Michael J. Lyden						Signature Michael J. Lyden		Month Day Year 10/3/91					
17. Transporter 1 Acknowledgement of Receipt of Materials						Signature John Tuttle		Month Day Year 10/3/91					
18. Transporter 2 Acknowledgement of Receipt of Materials						Signature		Month Day Year					
19. Discrepancy Indication Space													
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.						Signature Frank G. Hegarty		Month Day Year 10/3/91					
Printed/Typed Name Frank G. Hegarty						Signature Frank G. Hegarty		Month Day Year 10/3/91					

**APPENDIX E**

**III. DESTRUCTION/DISPOSAL CERTIFICATES**



L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

Burn  
Certs.  
1-10

TO: GARY GRIESENBECK  
TRM, INC  
23555 EUCLID AVE.  
CLEVELAND, OH

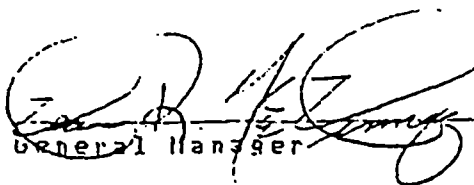
44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

Peggy,  
Here are the burn  
certificates for  
TAPCO Soil loads  
001 Thru 010.  
Please clear for paym  
See me if question G.C.  
10/6/89

This document certifies that L W D, Inc. ( hereinafter  
known as the TSD facility ) has serviced wastes  
sent to the TSD facility by TRM, INC.  
with Manifest No. 00001

The TSD facility certifies that these wastes were  
incinerated on 9-16-89 in accordance with  
operating permit number KY0088439817 parameters  
at Calvert City, Kentucky, and that such disposal  
method complies with all applicable Federal / State  
laws and regulations.

  
General Manager Date 215/89

OK  
10/6

4091



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

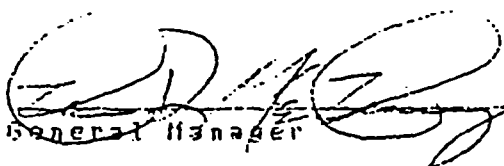
TO: GARY GRIESENBECK  
TRU, INC  
23555 EUCLID AVE.  
CLEVELAND, OH

44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRU, INC. with Manifest No. 00002

The TSD facility certifies that these wastes were incinerated on 9-17-89 in accordance with operating permit number KY0088438817 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

  
General Manager Date 2/5/89

OK  
10/6  
4091



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

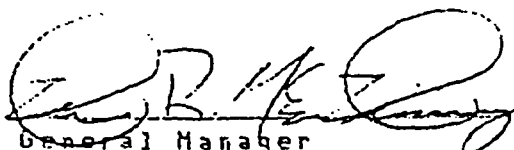
TO: GARY GRIESENBECK  
TRW, INC  
23555 EUCLID AVE.  
CLEVELAND, OH


44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRW, INC. with Manifest No. 00003

The TSD facility certifies that these wastes were incinerated on 9-18-89 in accordance with operating permit number KY0080438017 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

 21 Sept 89  
General Manager Date

OK  
  
10/6

1091



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

TO: GARY GRIESENBECK  
TRU, INC.  
23555 EUCLID AVE.  
CLEVELAND, OH

44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRU, INC. with Manifest No. 00004

The TSD facility certifies that these wastes were incinerated on 9-18-89 in accordance with operating permit number KY0088438817 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

General Manager

21-Sept 89

OK  
10/6

4091



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

TO: GARY GRIESENBEEK  
TRW, INC  
23555 EUCLID AVE.  
CLEVELAND, OH

44117


FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRW, INC. with Manifest No. 00005

The TSD facility certifies that these wastes were incinerated on 9-19-89 in accordance with operating permit number KY0008430812 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

  
General Manager

21 Sept 89  
Date

OK  
  
4091  
10/6/89



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

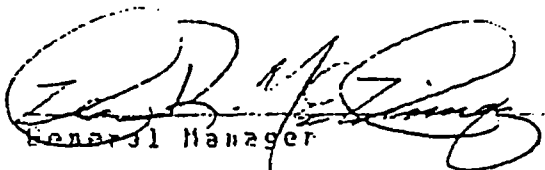
TO: GARY GRIESENDECK  
TRU. INC  
23555 ENCLIO AVE.  
CLEVELAND, OH

44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRU, INC. with Manifest No. 00006.

The TSD facility certifies that these wastes were incinerated on 9-19-89 in accordance with operating permit number KY0080430817 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

  
General Manager Date 21 Sept 89

OK  
10/6  
4091



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

TO: GARY GRIESENBEEK  
TRU, INC  
23555 EUCLID AVE.  
CLEVELAND, OH

04117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRU, INC. with Manifest No. 00002.

The TSD facility certifies that these wastes were incinerated on 9-20-89 in accordance with operating permit number KY0088408817 parameters at Calvert City, Kentucky. and that such disposal method complies with all applicable Federal / State laws and regulations.

  
General Manager Date 315/89

OK  
10/6  
4091



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

TO: GARY GRIESENUECK  
TRU. INC  
23555 EUCLID AVE.  
CLEVELAND, OH

44117

FROM: LUB, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by IRM, INC. with Manifest No. 00008.

The TSD facility certifies that these wastes were incinerated on 9-20-89 in accordance with operating permit number KY0088438817 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

General Manager

Date

OK  
4091



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

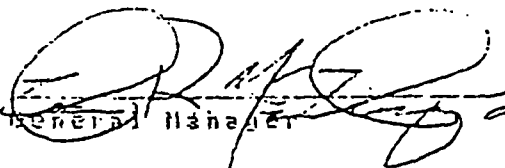
TO: GARY GRIESENBECK  
TRU, INC  
23555 EUCLID AVE.  
CLEVELAND, OH

44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRU, INC. with Manifest No. 00009.

The TSD facility certifies that these wastes were incinerated on 9-22-89 in accordance with operating permit number KY0009438017 parameters at Calvert City, Kentucky. and that such disposal method complies with all applicable Federal / State laws and regulations.

  
General Manager Date 21-5-89

OK  
  
10/6  
4091



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029


TO: GARY GRIESENBEEK  
TRU, INC  
23555 EUCLID AVE.  
CLEVELAND, OH

44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRU, INC. with Manifest No. 00010.

The TSD facility certifies that these wastes were incinerated on 9-22-89 in accordance with operating permit number KY00000430817 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

  
General Manager Date 21 Sept 89

OK  
10/6  
4091



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

TO: GARY GRIESENBECK  
TRW, INC  
23555 EUCLID AVE.  
CLEVELAND, OH

44117

FROM: LWB, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by LWB, INC. with Manifest No. 00011

The TSD facility certifies that these wastes were incinerated on 9-28-89 in accordance with operating permit number KY0088430017 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

 10/04/89  
General Manager Date



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

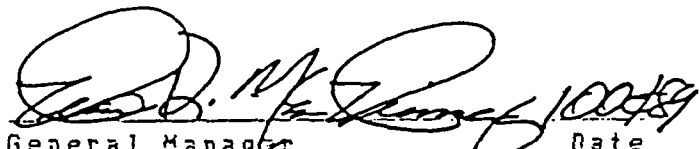
TO: GARY GRIESENBECK  
TRW, INC  
23555 EUCLID AVE.  
CLEVELAND, OH

44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRW, INC with Manifest No. 00012

The TSD facility certifies that these wastes were incinerated on 9-30-89 in accordance with operating permit number KYD088438817 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

  
General Manager

10/4/89  
Date



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

TO: GARY GRIESENBECK  
TRW, INC  
23555 EUCLID AVE.  
CLEVELAND, OH

44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TPW, INC with Manifest No. 00013

The TSD facility certifies that these wastes were incinerated on 9-30-89 in accordance with operating permit number KYD089438817 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

  
General Manager

6/10/89  
Date



LWD, INC.

P.O. BOX 327 - CALVERT CITY, KENTUCKY 42029

TO: GARY GRIESENBECK  
TRW, INC  
23555 EUCLID AVE.  
CLEVELAND, OH

44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRW, INC with Manifest No. 00014

The TSD facility certifies that these wastes were incinerated on 10-10-89 in accordance with operating permit number KY0088438617 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

  
General Manager Date 20 04/89



LWD, INC.

P.O. BOX 327 - CALVERT CITY, KENTUCKY 42029


TO: GARY GRIESENBECK  
TRW, INC  
23555 EUCLID AVE.  
CLEVELAND, OH.

44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRW, INC with Manifest No. 00015

The TSD facility certifies that these wastes were incinerated on 10-10-89 in accordance with operating permit number KYD066438617 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

  
General Manager

20 Oct 89  
Date



LWD, INC.

P.O. BOX 327 - CALVERT CITY, KENTUCKY 42029


TO: GARY GRIESENBECK  
TRW, INC  
23555 EUCLID AVE.  
CLEVELAND, OH

44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRW, INC. with Manifest No. 00016.

The TSD facility certifies that those wastes were incinerated on 1-1-90 in accordance with operating permit number KY908843881 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

  
General Manager Date 4 Jan 90



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029


TO: GARY GRIESENBECK  
TRU. INC  
28555 EUCLID AVE.  
CLEVELAND OH

44117

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. ( hereinafter known as the TSD facility ) has serviced wastes sent to the TSD facility by TRU, INC with Manifest No. 00001 PC# HS-89.

The TSD facility certifies that these wastes were incinerated on 01-22-90 in accordance with operating permit number KYD088438817 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

 25 Jan 90  
General Manager Date



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

TO: GARY GRIESENBROCK  
TBO, INC  
23555 ELLIOT AVE  
CLEVELAND OH

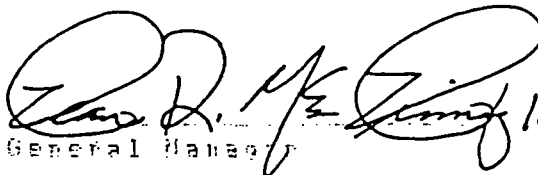
44117

FROM: LWD, INC  
P.O. BOX 327  
CALVERT CITY, KENTUCKY  
42029

This document certifies that L W D, Inc. (hereinafter known as the TSD facility) has serviced wastes sent to the TSD facility by TBO, INC. with Manifest No. 00002

*Product #H5-41*

The TSD facility certifies that these wastes were incinerated on 01-03-90 in accordance with operating permit number KYP089438817 parameters at Calvert City, Kentucky, and that such disposal method complies with all applicable Federal / State laws and regulations.

  
General Manager Date 15 Jan 90



# L W D, INC.

P.O. BOX 327 — CALVERT CITY, KENTUCKY 42029

RECEIVED

FEB 26 1990

CLEVELAND ES

TO: FARY GRIERBURECK  
FPM, INC.  
25555 EUD. L. AVE  
CLEVELAND, OH

FROM: LWD, INC.  
P.O. BOX 327  
CALVERT CITY, KY 42029

(This letter certifies that LWD, Inc. (hereinafter known as the "ISO Facility") has serviced wastes sent to the ISO Facility by FPM, INC. with receipt # 00001.....)

PC# HR 57, HT14

The ISO Facility certifies that these wastes were manifested on 01-22-90 in accordance with operating permit number KY000813861" received at Calvert City, Kentucky, and that such disposed wastes complied with all applicable Federal & State laws and regulations.

 8 Feb 90  
General Manager Date



ENVIRONMENTAL SERVICES COMPANIES  
2900 BROADWAY  
CLEVELAND, OHIO 44115  
(216) 429-2401

CERTIFICATE OF DISPOSAL

This certificate signifies that on the date stated below, the waste shipment identified as:

Non-Hazardous per existing Federal Hazardous Waste Management Regulations (RCRA)....water from cleaning activities (TRW-1900 Richmond Rd., Cleveland, OH), 3/23/90, was

processed and disposed of according to all applicable State and Federal regulations.

CLEAN HARBORS OF CLEVELAND, INC.

Jon A. Dixon  
Vice President/General Manager

EPA #OHD000724153